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ABSTRACT

The Education Council Act of 1991 established the National Education Commission on Time and Learning as an independent advisory body and called for a comprehensive review of the relationship between time and learning in U.S. schools. This document serves as a supplementary volume to the commission's first report released in May 1994, which found that most school-reform designs are structurally flawed by their adherence to a traditional school calendar. This volume describes innovative approaches to the use of school time. It provides nearly 40 examples of exemplary efforts to make better use of available time and extend the amount of time students spend learning. The brief program descriptions are from 15 elementary schools, 15 middle and senior high schools, 4 districtwide efforts, and 6 special programs. They include public and private schools in rural, urban, and suburban areas from 26 states. Information for reaching contact persons is provided. A review of the programs indicates that many different kinds of schools and districts have already implemented many of the commission's recommendations. The most common approaches in descending order include: (1) redesigning available time; (2) employing technology; (3) extending the school day or year; (4) providing time for professional development; and (5) providing support services for children or families. Finally, the approaches to the redesign of time usage differ by school level. (LMI)

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PRISONERS OF TIME

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ED 378 686

Schools and Programs Making Time Work for Students and Teachers

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Report of the National Education Commission on Time and Learning

EA 026 454

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PRISONERS OF TIME

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September 1994

Report of the National Education Commission on Time and Learning

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LETTER OF TRANSMITTAL

September 1994

The Honorable Albert Gore
President
United States Senate

The Honorable Thomas S. Foley
Speaker
United States House of Representatives

The Honorable Richard W. Riley
Secretary
United States Department of Education

Gentlemen:

Public Law 102-62 (The Education Council Act of 1991) established the National Education Commission on Time and Learning as an independent advisory body and called for a comprehensive review of the relationship between time and learning in the nation's schools.

The legislation established a nine-member Commission (three each to be appointed by the Secretary of Education, the President of the Senate, and the Speaker of the House of Representatives) and directed it to prepare a report on its findings for the American people within two years of its first meeting.

That report, Prisoners of Time, *was released in May 1994 amidst widespread public and editorial approval. It contained several straightforward messages. Learning in America is a prisoner of time. Times have changed, and the nation's schools must change with them. We have been asking the impossible of our students—that they learn as much as their foreign peers while spending only half as much time in core academic subjects. The*

reform movement of the last decade is destined to founder unless it is harnessed to more time for learning. Time is the unacknowledged design flaw in American schools.

When Prisoners of Time *was released, the Commission, whose legislative mandate expires in September 1994, asked its staff to develop a supplementary volume describing innovative approaches to the uses of school time. I am pleased to enclose the fruits of their work for your consideration.* Prisoners of Time: Schools Making Time Work for Students and Teachers *provides nearly 40 examples of exemplary efforts, supported by schools, school districts, or non-school partners, to make better use of available time and extend the amount of time students spend learning. These programs are but a sampling of many public and private school efforts—from preschool through grade 12—across the United States.*

With this volume, the work of the National Education Commission on Time and Learning draws to a close. I know I speak for every member of the Commission in expressing our gratitude to each of you for your support of our work.

John Hodge Jones
Chairman
National Education Commission on Time and Learning
Superintendent
Murfreesboro City Schools, Tennessee

COMMISSION MEMBERSHIP

John Hodge Jones, Murfreesboro, Tennessee — Jones is Commission chairman and school superintendent in Murfreesboro, Tennessee. Under his leadership, the school system has implemented a nationally recognized extended day and year program.

Carol Schwartz, Washington, District of Columbia — Vice chairman of the Commission, Schwartz has served on the District of Columbia Board of Education and City Council. She has been a special education teacher and a consultant to the U.S. Department of Education.

Michael J. Barrett, Cambridge, Massachusetts — Barrett represents four communities in the Massachusetts Senate. His 1990 cover story in *The Atlantic* helped spark a national debate about extending the school year.

B. Marie Byers, Hagerstown, Maryland — A former teacher, Mrs. Byers is serving her 24th year on the Washington County Board of Education and is chair of the National School Board Association's Large District Forum. In 1990-91 she was president of the Maryland Association of Boards of Education.

Christopher T. Cross, Chevy Chase, Maryland — Cross is president of the Council for Basic Education and also serves as president of the Maryland State Board of Education. He is a former assistant secretary for educational research and improvement in the U.S. Department of Education.

Denis P. Doyle, Chevy Chase, Maryland — Doyle is a senior fellow at the Hudson Institute and was formerly with the American Enterprise Institute. A political scientist, he writes extensively about education policy and school reform.

Norman E. Higgins, Guilford, Maine — A former teacher, Higgins is principal of Piscataquis Community High School. He has served on Maine's Common Core of Learning Commission and, in 1988, earned a National Alliance for the Arts Leadership Award.

William E. Shelton, Ypsilanti, Michigan — A former teacher and principal, Shelton is president of Eastern Michigan University. He is active in local and national organizations and has written on higher education issues.

Glenn R. Walker, Hiawatha, Kansas — Walker is a former teacher and Fulbright fellow. He is the newly appointed principal of Hiawatha High School. From 1987 to 1991 Walker was state chairman of the "Initiative for Understanding: US-USSR Youth Exchange."

EXECUTIVE DIRECTOR

Milton Goldberg is Executive Director of the Commission. He was executive director of the National Commission on Excellence in Education, which produced the landmark report, *A Nation At Risk*. He has held a variety of teaching and administrative positions.

INTRODUCTION

Fixing the Design Flaw

INTRODUCTION

On May 5, 1994 the National Education Commission on Time and Learning issued the results of its two-year investigation, a report entitled *Prisoners of Time.** "Learning in America is a prisoner of time," said the Commission, arguing that the time available "in a uniform six-hour day and a 180-day year is the unacknowledged design flaw in American education."

To fix the design flaw, the Commission proposed buttressing the sweeping reform agenda established by Congress and the Clinton Administration in the Goals 2000: Educate America Act legislation by having schools remain open longer while adjusting time to help individual students meet high standards.

Prisoners of Time was issued after 24 months of study that included visits to 19 schools, testimony from more than 150 teachers, administrators, parents, students, and experts, and two fact-finding trips to schools and research institutes in Germany and Japan.

CONTROL BY THE CLOCK AND THE CALENDAR

The Commission pointed out that the clock and calendar control American education to a surprising degree—schools typically open and close at the same time each day; class periods average 51 minutes nationally, no matter how complex the subject or how well-prepared the student; schools devote about 5.6 hours a day for 180 days to instruction of all kinds, and they award high school diplomas on the basis of Carnegie units, or "seat time."

"The results are predictable," the report said. The school clock governs how families organize their lives, how administrators oversee their schools ... how teachers work their way through the curriculum ... how material is presented to students and the opportunity they have to comprehend and master it.

"Despite the obsession with time, little attention is paid to how it is used," the Commission said. In 42 states, it noted, "only 41 percent of secondary school time must be spent on core academic subjects."

According to the report, longer school days and school years overseas, combined with better use of time, mean that "French, German, and Japanese students receive more than twice as much core academic instruction as American students.... American students cannot learn as much as their foreign peers in half the time," the report concluded.

Time is "the missing element in the school reform debate," said the Commission, and the overlooked solution to the academic standards problem. "Used wisely and well, time can be the academic equalizer."

RECOMMENDATIONS

To help all students master high standards, the Commission proposed eight recommendations to put time at the top of the nation's education reform agenda:

I. Reinvent schools around learning, not time.

II. Fix the design flaw: Use time in new and better ways.

III. Establish an academic day.

* *Prisoners of Time*, the report of the National Education Commission on Time and Learning, can be ordered from the U.S. Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, D.C. 20402-9328.

IV. Keep schools open longer to meet the needs of children and communities.

V. Give teachers the time they need.

VI. Invest in technology.

VII. Develop local action plans to transform schools.

VIII. Share the responsibility: Finger pointing and evasion must end.

The Commission pointed to "five premises educators know to be false" as a "foundation of sand" for learning in the United States:

The first premise "is the assumption that students arrive at school ready to learn in the same way, on the same schedule, all in rhythm with each other.

"The second is the notion that academic time can be used for nonacademic purposes with no effect on learning.

"Next is the pretense that because yesterday's calendar was good enough for us, it should be good enough for our children—despite major changes in the larger society.

"Fourth is the myth that schools can be transformed without giving teachers the time they need to retool themselves and reorganize their work."

"Finally," said the Commission, "we find a new fiction: It is reasonable to expect world-class academic performance from our students within the time-bound system that is already failing them."

Acknowledging that its recommendations might cost money, the Commission insisted its proposals can be financed if "educators bring common sense and ingenuity to the table."

The Commission called for setting priorities in education funding, seeking financial support from other units of government for extended-day services, and establishing fee schedules, based on ability to pay, for additional services.

NEW APPROACHES

Against the backdrop of that report, the Commission asked its staff to prepare a supplementary document describing how selected schools experiment with time, schedules, and calendars. The Commission hoped that publication of these examples would provide the public with information on how real schools in real communities have organized themselves to use time in new and innovative ways. This document is that supplementary report.

The programs described in this document have been gathered from several sources:

- A review prepared by Pelavin and Associates, Washington, D.C., during the Commission's initial investigation suggested several schools.
- The schools visited by the Commission during its work have been included.
- The Commission solicited suggestions from analysts and experts interested in its work, and the staff made a concerted effort to obtain descriptions of programs involved with various nationally prominent networks—Theodore Sizer's Coalition for Essential Schools, Henry Levin's Accelerated Schools program, Next Century Schools of the RJR Nabisco Foundation, the New American Schools Development Corporation, Edward Zigler's Schools for the 21st Century, and James Comer's School Development Program.

This report includes 40 brief program descriptions—15 elementary schools, 15 middle and senior high schools, 4 districtwide efforts, and 6 special programs, primarily summer camps or university-sponsored efforts to apply new technologies to the teaching and learning process. These examples include public and private schools in urban, suburban, and rural areas from every region of the nation and represent 26 states in all—stretching from the Canadian border to the Gulf of Mexico, and from Long Island Sound to Puget Sound.

This report is intended to be illustrative and suggestive. It makes no effort to provide comprehensive coverage of every program experimenting with alternative calendars, or to provide elaborate descriptions of the models included. In illustrating what is

possible and suggesting different approaches, the report does three things.

DIVERSE AND CREATIVE

First, it indicates that many different kinds of schools and districts, in many different communities with diverse student populations, are already implementing many of the recommendations of the National Education Commission on Time and Learning (see Table 1). Based on the material provided by these programs, the Commission staff concludes that the majority of these schools and districts are already engaged in efforts to implement four or more of the Commission's eight major recommendations. A handful appear to have made solid progress on all eight recommendations, and a few have concentrated on a limited number of the recommendations.

Second, these models suggest remarkable creativity on the part of school personnel in reconceptualizing the use of school time. Of the models included in this report, the most common approaches in descending order are (1) redesigning available time; (2) employing technology; (3) extending the school day or year; (4) providing time for professional development; and (5) providing support services for children or families (see Table 2).

One school (Davis Elementary, Gresham, Oregon) has done something as simple as providing mathematics instruction during recesses, lunch-time, and vacations (Recess Math). Others (e.g., Beacon High School, Oakland, California; Brooks Global Studies Magnet School, Greensboro, North Carolina; the Cornerstone Schools, Detroit, Michigan; and New Stanley Elementary, Kansas City, Kansas) have extended the school year by 10, 20, even 60 days—although all students do not attend for the entire extended time.

Yet others (e.g., Ponderosa Elementary School, Sunnyvale, California and North Branch High School, North Branch, Minnesota) provide optional additional time for some students—summer school for students experiencing difficulty or optional additional school quarters for students wishing to complete their studies early.

DIFFERENT APPROACHES FOR DIFFERENT LEVELS OF SCHOOLING

Third, these models indicate that approaches to redesigning time-usage in schools differ by school level, that is, elementary, middle, and secondary school. Table 2 is instructive. It not only classifies the 30 school-based programs in terms of their major program emphases, but also displays major program emphases by school level. Based on this small, nonrepresentative sample of schools, it appears clear that approaches to nontraditional schedules differ markedly between elementary schools, on the one hand, and middle and secondary schools on the other.

At both school levels, providing time for professional development is a major consideration. Approaches to providing this time vary: Beacon Day School in Oakland California rotates every staff member periodically for professional development by using full-time "flex" teachers who substitute for regular classroom teachers. Fairdale High School, Fairdale, Kentucky, is organized around "collaborative learning communities" that encourage five to seven teachers to join together in planning for and assessing the needs of up to 150 students. At Hefferan Elementary School, Chicago, Illinois, teachers receive a full day, every week, for in-service training, planning, or attending workshops.

Although redesigned time usage appears to be the favored approach for all schools, it is the least popular approach at the elementary level. Only 2 of the 15 elementary school programs explicitly mention redesigning time—and in both of these institutions (Ashley River Elementary and Beacon Day School), the redesign of time involves ungraded classrooms.

At the middle and secondary levels, however, redesigning available time is by far the most popular approach, and strategies to accomplish that goal vary widely. Sir Francis Drake High School, San Anselmo, California, combines block scheduling with an additional 17 days of school. Salt Lake City Community High School in Utah is an alternative high school operating through

TABLE 1

IMPLEMENTATION OF THE RECOMMENDATIONS OF THE NATIONAL EDUCATION COMMISSION ON TIME AND LEARNING

RECOMMENDATION:	I REINVENT SCHOOLS AROUND LEARNING	II FIX DESIGN FLAW	III ESTABLISH ACADEMIC DAY	IV KEEP SCHOOLS OPEN LONGER	V PROVIDE TEACHERS TIME	VI INVEST IN TECHNOLOGY	VII DEVELOP LOCAL ACTION PLANS	VIII SHARE THE RESPONSIBILITY
ELEMENTARY SCHOOLS								
Ashley River Elementary School Charleston, South Carolina	x	x			x	x	x	
Beacon Day School Oakland, California	x	x	x	x	x			
Bowling Park Schools Norfolk, Virginia	x	x		x	x		x	x
Brook Global Studies Magnet Greensboro, North Carolina	x	x		x	x	x	x	
Charter Oak West Hartford, Connecticut	x	x		x			x	x
Cornerstone Elementary Detroit, Michigan	x	x	x	x	x	x	x	x
Davis Elementary Gresham, Oregon	x	x	x	x		x	x	x
Emerson Elementary School Albuquerque, New Mexico	x	x		x	x		x	x
Hansberry Academy Bronx, New York	x	x	x	x	x	x	x	x
Hefferan Elementary School Chicago, Illinois	x	x		x	x	x	x	x
John Muir Elementary Seattle, Washington	x	x			x	x	x	
New Stanley Elementary School Kansas City, Kansas	x	x		x	x		x	
Park View Optional Year-Round School Mooresville, North Carolina		x		x	x		x	
Ponderosa Elementary School Sunnyvale, California		x		x	x			x
Sahuarita Elementary School Sahuarita, Arizona						x	x	x
MIDDLE AND HIGH SCHOOLS								
Accelerated Learning Laboratory (A Co-NBCT School) Worcester, Massachusetts	x				x	x	x	
Beacon High School Oakland, California	x	x	x	x	x			
Carl Sandburg Intermediate School Alexandria, Virginia	x	x	x	x			x	x
Fairdale High School Fairdale, Kentucky	x	x		x	x		x	x
Independence High School Columbus, Ohio	x	x	x		x		x	x

RECOMMENDATION	I. Prevent School Before Learning	II. Fix Design Flaw	III. Establish Academic Day	IV. Keep Schools Open Longer	V. Provide Teachers Time	VI. Invest in Technology	VII. Develop Local Action Plans	VIII. Share Responsibility
James A. Foshay Middle School Los Angeles, California	x			x				x
James P. Timilty Middle School Roxbury, Massachusetts	x	x		x		x	x	x
North Branch High School North Branch, Minnesota	x	x		x			x	
Perry McCluer High School Buena Vista, Virginia	x	x		x			x	x
Piscataquis Community High School Guilford, Maine	x	x	x	x	x	x	x	x
Salt Lake Community High School Salt Lake City, Utah	x	x		x			x	x
Sir Francis Drake High School San Anselmo, California	x	x		x	x	x	x	
St. Petersburg Senior High School St. Petersburg, Florida	x	x	x					
Thomas Jefferson High School Alexandria, Virginia	x	x	x	x	x	x	x	x
SCHOOL DISTRICT PROGRAMS								
Lake County Schools Leadville, Colorado		x		x			x	x
Murfreesboro City Schools Murfreesboro, Tennessee	x	x		x			x	x
Socorro Independent School District El Paso, Texas	x	x		x			x	x
Washington County School District Hagerstown, Maryland						x		
TECHNOLOGY / OTHER PROGRAMS								
Chapel Square Technology Center Annandale, Virginia					x	x	x	
Craftsmanship 2000 Tulsa, Oklahoma	x	x		x	x	x	x	x
Hunterdon Central Regional District Flemington, New Jersey						x	x	
Image Processing for Teaching University of Arizona Tucson, Arizona					x	x		
Learning through Collaborative Visualization Northwestern University Evanston, Illinois						x		
National Youth Science Foundation York, South Carolina	x	x		x				

several "satellite" campuses that permit students to take classes when and where they need them, including evening classes. Independence High School, Columbus, Ohio, employs variations on a common theme: instead of asking students to attend six different classes every day for 180 days, this school breaks down the year into quarters and encourages students to attend fewer classes, in two- or even four-hour sessions, in each of the quarters.

Finally, different approaches to support services deserve attention. Social services, health care screening, recreation, and developmental child care are much more likely to be mentioned as central aspects of school strategies at the elementary level than the middle or high school years. Schools such as Bowling Park Elementary, Norfolk, Virginia, are likely to offer an extensive array of such services to their students. Only Salt Lake City Community High School explicitly mentions support services in its materials—and these services appear to be more attuned to the needs of the students' children rather than to the students attending the high school.

COSTS AND RESULTS

Several generalizations can safely be made about the costs and effectiveness of these programs. First, cost data on most of these programs are not available. The more ambitious the program, the more it costs. Some schools and districts have kept expenses to a minimum by forming partnerships with foundations, corporations, and other units of government, and turning to parents to help defray costs for additional services. In fact, such creative approaches often mean that school districts have mounted extensive efforts at no additional cost to the general taxpayer.

Second, there are few formal evaluations. Those that exist might not stand up to professional peer-scrutiny. Nonetheless, anecdotal evidence of the value of these programs indicates that the benefits of these programs are considerable.

Costs. All of these programs cost something, at least initially. A modest-sized school district, enrolling perhaps 10,000 students at an expenditure of $6,000 per student begins each school year with about $60 million in its budget and close to 1,000 teachers and other professional staff on its payroll. Hypothetically, such a district has a great deal of flexibility within the constraints of its current budget and personnel ceilings to redesign time usage.

But what is possible in theory is very difficult in practice. Students are already in class. They arrive every day. They have to be served. The community is familiar with the current school, its offerings and operations, and its schedule. At a bare minimum, a major time-redesign effort requires freeing up teachers, principals, school district administrators, and curriculum and learning specialists to plan and implement new approaches—and to make sure that all of the myriad details that go into managing a complex school district are taken into account.

Most of the school-specific approaches described in this document—but by no means all—required initial outside support. Most appear to have planned and implemented their changes with the assistance of foundations or other outside support. The RJR Nabisco Foundation provided critical seed capital for several of the school efforts described here—including Davis Elementary, Gresham, Oregon; New Stanley Elementary, Kansas City, Kansas; Carl Sandburg Intermediate School, Alexandria, Virginia; Sir Francis Drake High School, San Anselmo, California; and Piscataquis Community High School, Guilford, Maine.

Others drew on the results of major investments in reinventing schools—and time usage within schools—already made by significant national reform networks. Singly, or in combination, the Accelerated Schools Program, the Coalition for Essential Schools, Schools for the 21st Century, the New American Schools Development Corporation, and the School Development Program provided design assistance worth millions of dollars to such diverse schools as

Bowling Park Elementary, Norfolk, Virginia; Hansberry Academy, Bronx, New York; John Muir Elementary, Seattle, Washington; Accelerated Learning Laboratory, Worcester, Massachusetts; and Fairdale High School, Fairdale, Kentucky.

Some schools sought other sources of funds. Hefferan Elementary in Chicago turned to Turner Construction Company, Rush University Medical Center, and the Ameritech Foundation for assistance. Charter Oak School in West Hartford sought and received assistance from the Kellogg Foundation. The Cornerstone Schools in Detroit took advantage of assistance from the Genesis Foundation and created a Partnership program that recruited 250 community leaders each contributing $2,000 to support the school.

A handful of the examples described in this document appear to have creatively used their existing budgets or the entrepreneurship of individual teachers or administrators. Murfreesboro City Schools, Murfreesboro, Tennessee, are committed to extended-day and extended-year programs, particularly before- and after-school programs. The district absorbed the planning costs and implemented the programs at no cost to district taxpayers through creative use of existing federal and state funds, and graduated fees, based on ability to pay, charged to parents.

North Branch High School, North Branch, Minnesota, explicitly noted in its planning documents that by the time a full four-year cycle of high school students had made its way through the new calendar, the costs would be identical to current costs. Sahuarita Elementary School, Sahuarita, Arizona, took advantage of the talents of 800 retirees in the Computer Club of Green Valley to equip the school with computers and provide at least one hour's instruction weekly in computer skills.

Evaluation. Very few of these programs provide evaluations of their effectiveness. Some, like Ashley River Elementary, Charleston, North Carolina; Davis Elementary, Gresham, Oregon; James Foshay Middle School, Los Angeles, California; Parry McCluer High School, Buena Vista, Virginia; and Ponderosa Elementary, Sunnyvale, California, point out that their students perform at or above national, state, and local levels on tests such as the Comprehensive Test of Basic Skills.

Others measure progress in non-academic terms, though they clearly note the importance of student achievement. Beacon Day School, Oakland, California, seems to consider the satisfaction of parents and students the best evidence of its effectiveness. Charter Oak Elementary, West Hartford, Connecticut, is more concerned with violence and drug usage as a justification for its

TABLE 2

MAJOR PROGRAM EMPHASES

	ALL SCHOOLS	ELEMENTARY	MIDDLE / SECONDARY
EMPHASIS			
Redesign time	**11**	**2**	**9**
Technology	9	4	5
Extend day or year	**8**	**5**	**3**
Time for professional development	8	4	4
Support services	**7**	**6**	**1**

Note: Numbers can add to more than 30 because all schools adopt more than one approach.

efforts than achievement gains. And many schools—such as the Hansberry Academy, Bronx, New York; Accelerated Learning Laboratory, Worcester, Massachusetts; and North Branch High School, North Branch, Minnesota—are barely up and running, too recently engaged with the changes they contemplate to have any results to show.

A few of the programs do, in fact, offer impressive evidence—if not always iron-clad evaluations—of the value of their new approaches. An evaluation team from Loyola University in Chicago has examined the 210-day global studies program of Brooks Global Studies Year-Round Magnet, Greensboro, North Carolina, and concluded that in both the first and second years of operation extended-year kindergarten students clearly outperformed a matching group of traditional-year students in reading and general knowledge—although few differences could be found in vocabulary or mathematics. When foundation funding ran out for the extended-day and year program at New Stanley Elementary School, Kansas City, Kansas, the school district picked up the extra costs of maintaining the program and announced plans to extend the concept to additional schools.

Likewise, Park View Optional Year-Round School, Mooresville, North Carolina, which provides parents with a choice between a 180-day program and a year-round calendar (45 days in school alternating with 15 days off), found that only one-third of parents initially opted for the year-round program, but the total today reaches two-thirds. Murfreesboro City Schools report a similar phenomenon. When the school district announced that one elementary school would be open from 6:00 a.m. until 6:00 p.m. with parents paying for the extended-day services, four students showed up. Within two years, public demand forced the extension of the concept to every elementary school in the city. This year, 50 percent of the city's 5,000 elementary school students can be found in the program on any given day, all on a voluntary basis on the part of parents.

Although formal evaluations, particularly evaluations of student achievement, are highly valuable, school responsiveness to community needs and parental satisfaction with school offerings may be crucial evaluation criteria that schools need to meet. The 40 models described in these pages indicate that many schools in the United States are responding to the challenge contained in the final paragraph of *Prisoners of Time*—and many more can.

"Today," said the Commission, "a new challenge beckons: We must face the test of time ... American students will have their best chance at success when they are no longer serving time, but time is serving them."

55 minutes
MAKING TIME WORK FOR
STUDENTS AND TEACHERS
May
Sept.
Tues.
6 hours
1:30
Friday
18

CHAPTER ONE

ELEMENTARY SCHOOLS

ASHLEY RIVER
ELEMENTARY SCHOOL
CHARLESTON, SOUTH CAROLINA

"Schools today must compete for the attention of a Nintendo generation raised in an audiovisual world."

You know the Ashley River Elementary School is different the minute you walk into it. The energy is palpable. Student work hangs from walls, tables, and ceilings. Students smile. Children in classrooms gather in cooperative teams and work intently at computers. Students and teachers plan projects, exchange ideas, and rehearse skits. A visiting artist demonstrates the mountain dulcimer. A parent helps two children research their project. A senior citizen holds a class spellbound with tales of her childhood, and a local attorney explains tort liability to fifth graders. It is no wonder that parents bring newborns to the school within days of their arrival to sign them up for this magnet school's waiting list.

Two considerations are key to the restructuring of this award-winning school under a forward-looking deregulation plan adopted by the state. First, it has made learning the goal—and time a variable—for its nongraded K-3 program in order to provide as much as "an extra year of time for developmentally at-risk children to catch up without penalty of failure." Second, Ashley River students have the opportunity to discover and explore their talents during classes in art, music, creative movement, drama, creative writing, and Spanish. If attracted to them, students can also sign up for electives in Suzuki violin, choral music, American Sign Language, ballet, and jazz dancing. "Nothing we're doing here is new," says Rose Maree Myers, principal of the school. "We haven't invented a new wheel."

Perhaps they haven't invented a new wheel, but the school appears to have succeeded in putting the joy back in learning. On any given day students can be found doing everything from playing xylophones to drawing sketches of their teachers. Observers in South Carolina believe Ashley River has taken greater advantage of new freedom from state regulation than any other school in the state.

"Schools today must compete for the attention of a Nintendo generation raised in an audiovisual world," according to Myers. Ashley River reaches this generation with an active learning environment emphasizing an interdisciplinary arts curriculum. The aim: break the mold of failure by providing interrelated experiences in arts and academic subjects to let children discover their strengths and talents. The ungraded early years permit students to progress at their own rates without the stigma of failure.

Ashley River officials point out that performance on nationally normed tests such as the Comprehensive Test of Basic Skills puts their students above national, state, and local averages in all areas. They also note that the school offers a comprehensive array of special programs such as speech, remedial reading, and special education—although "pull-out" programs are unknown. In 1992, Ashley River was recognized by the U.S. Department of Education as a "National Blue Ribbon Exemplary School."

One of the distinctive features of the plan the school submitted to the state was provision for common planning time for teachers. Each week, three 40-minute periods of common planning time are provided for all grade levels. Teachers use this time for planning and writing lesson units, brainstorming

about instruction, and discussing classroom or student problems. Every nine weeks, teachers at each grade level meet with the principal to talk over student progress, instructional problems, parental concerns, and anything else teachers want to discuss.

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BEACON DAY SCHOOL
OAKLAND, CALIFORNIA

A school year that never really ends.

At Beacon Day School in Oakland, California, the school year never really ends. At this private elementary school, the school day is over ten hours long. There is no set vacation period. Parents plan vacations to fit family needs. Students work in teams by achievement level, not age. Letter grades are unknown and students spend six to eight hours a week on art, music, dance, drama, or martial arts. "There's no summer vacation, so there's extra time to learn," 10-year old Colin Gage told the Commission.

Thelma Farley and Leslie Medine founded this award-winning school over a decade ago as a fundamental alternative to traditional notions of schooling. "We knew that what was going on in most schools was absolutely wrong," says Medine. "Nothing about the way schools were run had anything to do with the ways kids learn." This philosophy explains why Beacon kids are not scolded for getting up to stretch while the teacher talks or for sitting on the floor to study. It also explains why teachers eat lunch with the students and recess is five times longer than in most public schools.

Beacon Day is based on four simple ideas:

- Children learn best when they experience success, again and again.
- Children are individuals.
- The classroom is just the beginning.
- Diversity is an asset.

Based on students' developmental needs, Medine told the Commission, Day School students attend school 240 days a year. The school also responds to parents' needs. Most of the parents at the school work full-time and the school is open from 7:30 a.m. to 5:00 p.m., with teachers working on flexible schedules for 210 days. Every six weeks, at least two teachers are on leave, their places taken by eight permanent, full-time, substitute teachers known as "flexes."

Beacon is thought to be one of only three schools in the United States open 240 days a year. The other two? Beacon's sister institution, Beacon High School and the Cornerstone Schools in Detroit. (By contrast, every school in Japan is open 240 days a year, a figure that includes a half-day on Saturday, or a "school day" equivalent of about 220 days. Japanese education authorities recently decided to gradually eliminate the Saturday requirement.)

"We have no first-graders," says Medine. "We have only six-year-olds. Children develop unevenly—they develop unevenly within themselves and differently from each other. We had to rethink these little boxes called first grade, eighth grade, tenth grade and say 'these are children. What do they need?'"

Classes are organized according to the academic and social skills of individual students, rather than by age or standard grade levels. Children are encouraged to learn at their own pace, year round, and individual classes span an age range of two years with no more than 15 students in each classroom. "House heads"—veteran teachers—monitor students' progress in each of the three age groups and consult with individual teachers to determine when a child should progress to a more advanced group.

The curriculum is special as well. It is

built on an "arts core" of music, art, dance, and theater, taught by professional artists and designed to promote critical thinking.

Medine and Farley decided to start a school that was open throughout the year for purely educational reasons. "There was no reason to have kids in school for only nine months," says Medine. But they discovered an added benefit: the longer school day and longer school year are lifesavers for modern families, many of them single-parent or two-income households. Beacon's founders believe their innovation is the wave of the future.

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BOWLING PARK ELEMENTARY SCHOOL NORFOLK, VIRGINIA

Creating a community of caring individuals.

Bowling Park Elementary School is located in the midst of a public housing community in Norfolk—and the school and the community have faced all of the problems and difficulties endemic to many low-income, inner-city neighborhoods. In 1992, determined to make the school both a safe-haven for students and a source of community renewal, Bowling Park embarked on an ambitious new venture: It would become a CoZi Community School.

The school is a demonstration site for a collaborative effort launched by two nationally known school reform leaders, Edward Zigler, Sterling Professor of Psychology at Yale University, and James P. Comer, Maurice Falk Professor of Child Psychiatry at the Yale Child Study Center (the acronym CoZi was coined from the first letters of their last names). Zigler has created a nationwide network of "Schools for the 21st Century," and Comer is nationally known for the School Development Program, which encourages community engagement with local schools and a collaborative shared governance of the school.

CoZi combines elements of both approaches to provide a comprehensive strategy to create change in schools and address the critical needs of children and families. The new approach unites the School of the 21st Century's family services components with the child development principles of the School Development Program.

Bowling Park aims explicitly to create a "community of caring individuals" whose goal is to ensure that children develop and learn to their fullest. It emphasizes collaborative teaching and learning with support services for children and their families. CoZi's has five goals:

- **Rebuild community**—by encouraging administrators, teachers, children, parents, and community partners to work together through shared leadership strategies and efforts to involve adults and children in solving school problems.
- **Promote school-based intervention**—by involving parents and educators in child-centered, school-based planning (the Comer Process Team Approach) to increase attendance, achievement, a sense of self-worth, and overall development.
- **Focus on child development and learning**—by emphasizing all aspects of child development, including physical, social, emotional, language, and intellectual development.
- **Link family support services to the school**—by offering preschool programs, before- and after-school care, vacation care, and home visitation for parents of infants and toddlers through the Parents as Teachers Program.

- **Bond parents to the school community**—by providing parent development programs (e.g., shared decision making, parents as teachers, and adult education programs) and in the future by establishing a school-based health center (in the 1994-95 school year).

The ultimate goal of CoZi: to create an environment within the school that maximizes opportunities for administrators, teachers, and parents to work together to help all children realize their full academic and social potential.

Will the CoZi approach work? Only time will tell. But if energy and commitment in the school and the school community—from the school board down—combined with the help of some of the leading experts on school reform means anything, Bowling Park will soon be reaping the benefits of this new innovation.

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BROOKS GLOBAL STUDIES EXTENDED YEAR MAGNET GREENSBORO, NORTH CAROLINA

Many colors, one rainbow; many cultures, one family.

The Brooks Global Studies Extended Year Magnet is the only school in the Guilford County school system without a specific attendance zone. Parents and students from throughout the system may choose to attend Brooks—and more of them are choosing it. Opening in 1991 with 80 students, more than 300 students enrolled at the start of the 1993 school year, and more remained on a waiting list.

Three distinctive features make Brooks stand out:

- Its instructional program extends over 12 months and includes 210 days.
- It emphasizes global studies, that is, geography, citizenship, and respect for cultural diversity.
- It offers extensive after-school child enrichment services from 2:15 until 6:00 p.m.

Preliminary investigations by two psychologists from Loyola University of Chicago provide encouraging evidence that the longer instructional year pays off. Children receive an additional six weeks of instruction, with breaks provided periodically throughout the year and the school closed for two weeks during the summer. Field trips, guest speakers, and weekly foreign language instruction are emphasized during the program.

According to Loyola researchers Julie Frazier and Frederick Morrison:

- In the first year of the program (1991-92), extended-year kindergarten students clearly outperformed a matching group of traditional-year students in reading and general knowledge.
- Few differences between the two groups could be found in vocabulary and mathematics.
- The results for reading and general knowledge support the belief that additional instructional time leads to learning growth. The lack of effects in vocabulary and mathematics may reflect the relative lack of emphasis on these topics during kindergarten.
- In the second year of study (1992-93), global school kindergarten students made twice as much progress in reading and general knowledge over the summer as did students in the traditional 180-day program.
- Global school kindergartners also made twice as much progress as their peers during the traditional school year (fall to spring).

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- Once again, no differences appeared in the learning of vocabulary or mathematics.

Although these findings are encouraging, it is difficult to disentangle them from the school's unique curriculum which emphasizes, in the words of school principal Tony Meachum, that "just as many colors make one rainbow, many cultures make one national family."

School officials believe that rapid improvements in technology and communications make learning about the world and human cultures essential for today's young people.

The global studies program emphasizes the five major geography themes developed by the National Geographic Society: location (exactly where on the earth's surface places are found); place (the physical and human characteristics of specific places that set them apart from others); relationships within places (how humans interact with their environment, for both good and bad); movement (how people, products, information, and ideas within and among countries change); and regions (how regions form and develop).

Brooks officials stress that their after-school programs are not merely custodial care. After-School Enrichment Services (ACES) are available for a fee to interested parents and offer an impressive structured balance of academic, physical education, and recreation programs. Academic work includes homework time, work on basic skills, curriculum-related games, critical thinking skills, and silent reading time. The remainder of the time is devoted to physical education, games and other recreational activities such as movies, arts, crafts, and music.

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CHARTER OAK
WEST HARTFORD, CONNECTICUT

"Meeting the needs of children is not enough. Our parents have needs too!"

A frightened six-year-old first grader arrived at Charter Oak one day last year and told his teacher, "My mom needs your help. Daddy is yelling real loud." Immediate assistance was dispatched to the house. That afternoon, the mother came to visit the principal and is now working with one of the school's social work interns to reduce the stress in the home. "Meeting the needs of children is not enough. Our parents have needs too!" says Gwen Rustin, principal of the school. "Safety, trust and caring must come from all adults. Here at Charter Oak we are committed to see that it happens."

West Hartford is a suburb, bordering the much larger city of Hartford, with a school district made up of two high schools, two middle schools, and ten elementary schools offering kindergarten through grade 5. About 8,000 students are enrolled in West Hartford schools.

Each of the schools has its own character, but Charter Oak, because of its location and age, differs dramatically from the other elementary schools. The school, built in 1930, sits in the middle of a modest community of single family homes and duplexes and two public housing developments, and it abuts a high-crime neighborhood. The school's enrollment of 370 students is multicultural and multiracial, coming from homes speaking 16 different languages. About half the students are from minority backgrounds and a little more than one-third of the students receive free or reduced-price lunches. The school staff sees the diversity of its students as one of the school's great assets.

The school is not at all traditional. The staff learned quickly that students who live in poverty, who may be abused or neglected, who do not speak English as a first language, or who come from chemically dependent homes, may have trouble in traditional school settings—with seats arranged in rows that follow rigid age and grade structures.

Charter Oak is a multiage, multigraded school that encourages children of different ages to work on a variety of activities, either individually or in groups. The curriculum is organized thematically and emphasizes facts, problem solving, decision making, and communications skills in an integrated program.

The school began a Family Resource Center, funded with support from the Kellogg Foundation and the state, to help parents. The center provides services for children from birth through age three, child-parent play groups, family therapy, and acts as a local clearinghouse to help non-English speaking families locate the services they need. A youth development counselor provides activities for students in grades three through five through a drop-in center and a theater group.

Classrooms are structured into school families and each family has a name such as "Teddy Bear Express," "Rainbow Explorers," or "Future Flyers," to name a few. By organizing as families, a strong sense of community is built and extended to the home. Parents have the choice of opting for a straight level or multiage classroom for their child. Most children remain in their families for at least two years.

Safety and substance abuse are major concerns in the community and in the school. The school's "Here's Looking At You 2000" curriculum emphasizes the clear message that abstinence from drugs, including alcohol, is the only choice for every Charter Oak student. A West Hartford police officer works regularly with every classroom, from kindergarten through grade five, on such topics as drug and alcohol abuse, safety with guns and bicycles, and child abuse.

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CORNERSTONE SCHOOLS
DETROIT, MICHIGAN

"I firmly believe that, within this group of children, we do have some Langston Hugheses, some Maya Angelous, and some Duke Ellingtons."

The three Cornerstone Schools of Detroit (two elementary and one middle school) are firmly committed to both academic and religious goals. Supported by a coalition of mainline churches and business, industry, labor, community organizations, foundations, parents and citizens, the schools explicitly place "as much importance on learning gospel values and the teachings of Christ as on learning the multiplication tables." The aim: to "turn out good students and good people."

Designed to be interdenominational, the Cornerstone Schools were a response to a challenge issued to Detroit's business leaders in October 1990 by Catholic Archbishop Adam Maida who called on Detroit to reclaim its children and set them on a strong track for life.

Just ten months later, the three schools opened. By 1993-94 they had expanded on a site donated by a Lutheran congregation to an enrollment of 363 students.

The heart of the Cornerstone philosophy is found in its curriculum, its organization of time, and community involvement:

- The curriculum emphasizes the fundamentals of writing, reading, mathematics, science, and reasoning.
- The curriculum integrates moral development and character education—it focuses not on any particular Christian denomination, according to school officials, but on gospel values, the teachings of Christ, loving one's neighbor, and knowing Christ in daily life.
- All children participate in physical education, art, and music classes and take mandatory Spanish lessons. Every class stresses positive health habits. Every child is exposed to libraries, museums, and theaters, the "jewels of the city."

- Cornerstone's Linwood (middle school) campus is part of Ameritech's "Learning Village" computer network—one of 49 schools in the Midwest participating in a global network to let students interact internationally and develop collaborative, problem-solving skills.
- The three schools run on a 240-day school year instead of the traditional 180 days.
- Cornerstone's latch-key program begins at 7:00 a.m. and ends at 6:00 p.m. every weekday.
- Cornerstone has recruited about 350 community leaders, each devoting about $2,000 per year to the schools, as "Cornerstone Partners"—not just mentors, but friends to students, working with individual young people in 90-minute periods, intermittently throughout the year, so that students can learn, first-hand, the value of serving others.

With funding from the Genesis Foundation and partnership income, Cornerstone is able to keep the annual tuition to $1,875. Students are never turned away based on the family's inability to pay. About 60 percent of the enrollment is unable to cover the full tuition and students enroll with their families paying according to ability. Annual per student costs are about $4,000.

Janine Terrell, the mother of two girls attending Cornerstone, told the Commission that her daughters "love going to school here." Her children are not bothered by the fact that they are in school throughout the year since, "they don't know any other way." Dr. Henry told the Commission that public schools could succeed with the Cornerstone model, even without an underpinning of religious values, by "affirming the distinctiveness of every child and inculcating a sense of responsibility in every child."

According to Norma Henry: "I firmly believe that, within this group of children, we do have some Langston Hugheses, some Maya Angelous, and some Duke Ellingtons. We simply need to develop that right side of the brain that allows all of that creativity to emerge. One day, we'll all benefit from the talents that we find."

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DAVIS ELEMENTARY SCHOOL GRESHAM, OREGON

"Math instruction gets about equal time with physical education in most schools."

It's nice if programs attract students. It's even better if they help students learn. "Recess Math," a program launched in 1990 in Gresham, Oregon's Davis Elementary School appears to do both.

Thanks to a three-year, $250,000 grant from the RJR Nabisco Foundation, Davis provides math instruction before and after school, during the noon hour and recess, and during the summer months. Test results between the fall of 1990 and the fall of 1991 indicated that Davis's third, fourth, and fifth graders' math skills increased at a rate about 50 percent higher than other students in the system.

Although mathematics is listed in the National Education Goals, says Donnise Brown, the principal who established the program before moving on to Margaret Scott Elementary in Portland, many schools shortchange students in both math instruction and staff. "Math instruction runs about 45 minutes in most schools, getting far less attention than reading and about equal time with ... physical education," says Brown.

"Normally students lose ground over the summer," commented Curtis Anderson, the current Davis principal. "The Recess Math program gets them so ready for school they'll actually come into the first few weeks ahead

of where they were."

Students like the program because, unlike the traditional grind of math instruction, they get the chance to play with math. Worksheets cannot be found in Recess Math—instead students work with games and other activities that allow them to use mathematical concepts to solve problems. Working individually or in pairs, students log on to a computer and work their way through a series of programs designed to improve math skills and reinforce what they have already learned in the regular classroom.

Brown says she developed the program because the school was facing a big problem in the fall of 1989. Her students' math scores ranked well below district and state averages on standardized tests, other approaches had failed to help, and extracurricular activities were eating into classroom time.

Recess Math is added to the students' mandatory instruction and students sign up for it on a voluntary basis. Who would believe that children could be persuaded to use their free time to study mathematics? But in fact they will, if the program is interesting and challenging enough. In fact, Davis students clamor to get into it. Originally designed for 60 students, 90 applied for the inaugural session—a number that climbed as word of the program spread over the school grapevine.

The result, two years after the program started, was that test scores started rising dramatically and more than 80 percent of Davis students were enrolled. Although the program had to scramble for local support when the RJR Nabisco money ran out, according to teacher Christine Downing, at its height Recess Math averaged 100 students per day during the summer—out of a total school enrollment of 450.

Although the program is voluntary, teachers insist on genuine commitment to it. Entering students are required to sign a contract pledge that they will attend 20 classes during a four-week period—a class a day and a minimum of ten extra hours of math instruction each month. "I've been in this business for 32 years," says Brown, "and this is the first time I've seen such clear and convincing evidence that the innovation we implemented had its intended effect."

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EMERSON ELEMENTARY SCHOOL ALBUQUERQUE, NEW MEXICO

Meeting student needs in the Southwest.

Emerson Elementary sits in Albuquerque, the nation's 13th largest school district, like a kind of education United Nations—some 20 languages and cultures are represented in the school. Nine out of ten of its 800 students qualify for the free lunch program, and the school has to cope with an annual student turnover as high as 90 percent.

In Albuquerque, 90,000 children attend public schools. It is one of the growing number of "majority minority" districts in the United States. Forty-eight percent of enrollment in the Albuquerque schools is Anglo; 42.4 percent is Hispanic; 4.7 percent is Native American; 3.1 percent is African American; and 1.8 percent is Asian.

In 1986 the Albuquerque schools, including Emerson, adopted a "year-round" schedule because the burgeoning school population was putting a strain on strapped budgets, classroom space was at a premium, and school officials saw the potential for improving instruction by adopting a new calendar. The year-round program seems to be working well in Emerson, which operates a 12 week on, 15 day off, multitrack schedule with the entire school on vacation for three weeks in July. During the 15-day breaks, the school offers special programs to provide remedial or enrichment classes for

about 150 students.

By 1992, 26 Albuquerque year-round schools enrolled 15,000 students. According to Assistant School Superintendent Geraldine M. Harge, the year-round schedule offers significant advantages:

- effective pacing of the school year through the use of continuous breaks;
- enhanced options for enrichment and remediation throughout the year;
- opportunities for teacher collaboration and professional enrichment;
- more creative possibilities for student grouping; and
- better use of physical plant and the saving of millions of dollars in new school construction.

In three evaluation cycles, Albuquerque teachers and students have reported more learning and higher teacher morale. The 1992 North Central States evaluation team reported "more curriculum being covered due to less [post-summer vacation] review time needed" and "greater retention among low achievers."

But, Harge told the Commission, year-round education did not come easily to Albuquerque. "Tradition is strong," she said, and the "mythology of summer vacation is so pervasive that it takes precedence over educational values for some people. Facts and figures from experts make few inroads when family or social traditions are threatened." Despite these difficulties, Harge supported year-round education as an opportunity for education restructuring, an opportunity that can be realized only "when teachers, students, and parents use their learning schedule framework as part of a conscious educational improvement strategy."

To meet the needs of its diverse student population, Emerson has developed a special focus on school readiness. It operates a child development center for about 40 preschool children (one of six programs in Albuquerque). The center is particularly proud of its emphasis on parent participation and reports high rates of involvement in parent workshops and monthly parent-child activity days.

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HANSBERRY ACADEMY: A MODERN RED SCHOOLHOUSE BRONX, NEW YORK

All children can attain high academic standards and vary only in the time they need and ways they learn best.

Most Americans are familiar with the Little Red Schoolhouse of 19th century lore—built and supported by the sweat of the community, it educated every child well. As attractive as this memory is, much of it is a myth. The truth is that although the Little Red Schoolhouse educated some children very well, it did not work well for every student. Many students left the schools when they became old enough to work in a largely industrial and agrarian society. At that time in our history, this trend made little difference because we were a society that did not need vast numbers of highly educated people.

Today, the United States needs vast numbers of highly educated people in an increasingly complex economic and technological society. The Hudson Institute, with the support of the New American Schools Development Corporation, is trying to marry the attractive features of the 19th century schoolhouse to the economic and education realities of America in the 21st century through a new conception called The Modern Red Schoolhouse. Hansberry Academy, a public school in the Bronx, is one of six elementary schools in three states already up and running with the concept.

These schools will be joined by two middle school and one high school in the fall of 1994.

The Modern Red Schoolhouse attempts to unite a rigorous traditional curriculum with modern technologies to provide an excellent education for all students—at costs no higher than costs in regular school programs. It emphasizes world-class standards in core curriculum areas; comprehensive staff training; self-paced learning and individual education contracts for every student, along with flexible daily and yearly schedules; mastery examinations; parental and community involvement; and character building as an integral component in all aspects of schooling.

The Modern Red House Schoolhouse—including those sites such as Hansberry Elementary in New York and other sites in Indiana, North Carolina and Arizona, is built on six basic tenets, "pillars of reform:"

1. All children can learn and attain high standards in core academic subjects; they simply vary in the time they need to learn and the way they learn best.
2. Schools should help transmit a common culture that draws on the traditions and histories of our pluralistic society and the principles of liberal democratic government that unite us all. At the same time, the histories of other nations and peoples should be understood by all children.
3. Principals and teachers should have considerable freedom in organizing instruction to meet the needs of their students.
4. Schools should have greater flexibility in deciding how best to accomplish their mission and, at the same time, should be held accountable through meaningful assessment of student progress.
5. Advanced technology is a critical prerequisite to attaining high quality education in cost-effective ways.
6. Schools should be places where students and teachers choose to belong.

These principles, easy to state, are difficult to make real. The Modern Red Schoolhouse design team is trying to implement them in a number of ways. The design calls for replacing today's yardstick for learning, such as the Carnegie unit, (essentially a measure of seat time) with a new Hudson unit that makes time a variable and acknowledges that students will be considered to have achieved academic success when they demonstrate mastery of the knowledge and skills set forth in Modern Red Schoolhouse standards. These new curriculum units, although having to address a common set of standards, are being developed independently by teachers at each of the design sites—and shared electronically among the sites.

Hansberry Elementary offers after-school programs to meet student needs, in collaboration with local community development groups. In the fall of 1994, the design team hopes to encourage greater parental involvement with, and volunteer support for, the Modern Red Schoolhouse sites. Hansberry is planning a new mentoring program to help students with the new Hudson units.

At Beech Grove Middle School, Beech Grove, Indiana, the Modern Red Schoolhouse design will implement block scheduling to help break the rigid, lock-step of today's schedule. It also plans to bring in part-time teachers to free up the regular teaching staff for planning and professional development time.

So far, parents appear to like what they see. A parent in Columbus, Indiana, watched with surprise as a sixth grader answered a younger sibling's question about atoms by drawing a detailed diagram to explain neutrons and electrons. Said another, "This is gifted and talented education for all children."

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HEFFERAN ELEMENTARY SCHOOL
CHICAGO, ILLINOIS

"You can't leave a room for 45 minutes a day and not lose something."

The Hefferan school council, newly elected in 1990 as part of Chicago's citywide reform, knew it was in trouble when its principal suggested using discretionary funds to hire a choir director to teach gospel music and a full-time truant officer. According to parent Denise Ferguson, the school had great attendance rates, yet it had other problems. The school had only four computers, for example, and maps from 1945 indicated that Rhodesia still existed. "Besides," she was quoted, "our kids learned gospel music on weekends."

The council hired a new principal, Patricia Harvey (who has since been named Executive Assistant to the General Superintendent of Schools in Chicago). Together the principal and the parents created a new Hefferan. "They just did it themselves," said Chicago Mayor Richard Daley. "They go ahead and decide something and do it. They just do it."

Life outside the school is typical of many inner-city neighborhoods. Stark streets. Abandoned buildings. Graffiti. Rusting automobile wrecks and unemployed people. A crackhouse sits nearby. Neighborhood problems are so severe that outdoor recesses are out of the question.

But inside, the school's nearly 700 African-American students enter a different world: freshly painted halls, new desks, a fully equipped computer laboratory, a state-of-the-art science laboratory, and adults from the community falling all over each other in their determination to help these kids succeed. Inside the classrooms, students may be found singing, but it is Mozart as well as gospel, and speaking, but it is likely to be Japanese and not street slang. How did Hefferan do it?

One way to think about what the school accomplished is to think about the "Four T's": time, teachers, technology, and teamwork.

Time. One of the keys to Hefferan's success was the application of common sense to the issue of time and learning. Starting with a $10,000 grant from Ameritech, Harvey kept the school open after hours to make good on a "commitment to care for the whole child." Today hundreds of students are involved in about 35 before- and after-school clubs that provide safe places and healthy activities in a community with too few of both. In the science club, eighth graders work on a project on solar collectors. Former student Jason Ferguson said his test scores went up after joining the science club and spending his time on science instead of heading home to switch on the television.

The Turner Club is supported by the Turner Construction Company. Turner students worked on building-trades skills by constructing a wall, complete with plumbing, electricity, and a window. Harvey laughed that the students were prouder of the wall than Turner was of its new buildings.

Then Hefferan faced the issue of "pull-out" programs, in which low-achieving students were pulled out of regular classes for special instruction in reading and mathematics. "You can't leave a room for 45 minutes a day and not lose something," said Harvey, who served as school principal until 1994, and she pulled the plug on pullout. Students needing special help are now tutored outside regular school hours.

Teachers. "You can't build a house of shared decision making without a foundation of trust, acceptance, and real teamwork," said Harvey. To create the foundation, she was determined to give teachers the time they need for planning. Every week, teachers get a full day for in-service training, planning, or attending workshops. How is that possible? It's quite easy. Harvey says that one day a week students attend special classes in art, music and gym so that other classroom teachers can be freed up to learn and grow. Is this a teachers' issue or a time issue? It is both.

Technology. Next tackled was the problem of having only four computers in the school. Federal Chapter 1 funds were used to buy 35 new computers now used in every grade. But that was just the first step in the

technological development of Hefferan. The school's "science laboratory" differed from a regular classroom only in that it had a sink. An impressive new laboratory now boasts 18 experiment stations, complete with sinks, and it is stocked with its own menagerie of mice, snakes, plants, a rabbit, and a pet rat. The laboratory is a joint gift from Rush University Medical Center and Turner Construction.

Teamwork. Obviously none of this happened by accident. Teamwork was the key. Parents have used the school council to develop their teamwork skills. Teachers have used their planning time to become genuine teams. And Harvey has reached out to the business and philanthropic communities to create partnerships—to Turner Construction, Rush University, Ameritech, and others. And she has reached into the community as well. Because 80 to 90 percent of Hefferan students come from single-mother homes, Harvey has put together a group of 50 black men who regularly come and read to students. "When our kids see this huge group in shirts, ties, and suits," says Harvey, "it makes a difference." Parents help as well, in class and out. In fact, so many adults are in the school that last year it opened a Parents' Center, a "homeroom" for parents.

So the Hefferan story revolves around time, teachers, technology, and teamwork. All in all, a better way to spend money than on truant officers.

For additional information:
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JOHN MUIR ELEMENTARY SCHOOL
SEATTLE, WASHINGTON

"I'm seeing things I never expected to see."

By 1990, John Muir Elementary seemed to be just another casualty of urban neglect. Built in 1907, the school was literally falling apart—the structure decaying, the roof leaking, and student test scores falling. A drive-by shooting, in which rival gangs who just happened to be passing the school exchanged gunfire, frightened parents and children and galvanized outraged community leaders to action.

Today, it is getting high marks for educational innovation as a member of the "Accelerated Schools Program" of Stanford University, setting high expectations for students, transforming the educational environment of the school, and mobilizing the community to help.

Henry Levin, the director of the Center for Educational Research at Stanford (CERAS) has helped create more than 140 "accelerated schools" throughout the United States. He has to ward off schools, superintendents, boards, and politicians who want to sign up but show no signs of understanding the difficulty of transforming a school (or a district) along the lines of the three deceptively simple principles that undergird accelerated schools:

- unity of purpose;
- empowerment coupled with responsibility; and
- building on strengths.

What is an accelerated school? Levin's answer is straightforward. It is a school in which what we want for "at-risk" children is the same as what we want for all children. "Ask yourself the question," says Levin, "Is this the kind of school I would send my own child to?"

Levin and his partners in the 140 schools are people with a mission: to change traditional mindsets, establish high expectations for all students, make learning an exciting and enjoyable experience for children, and engage the entire school community—

students, parents, teachers, administrators, and neighborhood leaders—in the process. He describes the process as "low-budget education reform" explaining that planning costs money, but that once attitudes and processes have been changed, they normally become a part of the routine education budget.

The results are as varied as the schools in which they are found:

- At John Muir, students experiencing difficulty go to a community center after regular school hours and learn about cooking or gardening from volunteers in the hope that students who dislike science class might find gardening or cooking a more interesting introduction to the world of plants and chemicals.
- Students and teachers transformed McCleery Elementary School's gymnasium in Aurora, Illinois, into a lively western desert, complete with cactus, mountain flowers, paper owls and hedgehog reproductions. Native American art competed for attention with portraits of cowboys and cowgirls, and a collection of bandannas, hats, boots, and saddles. In the process of creating the exhibit, students were introduced to the art of Georgia O'Keefe, Allan Houser, and Frederic Remington and listened to the Grand Canyon Suite.
- Daniel Webster Elementary School in San Francisco went from near the bottom of that city's schools in test scores to the upper third. "Instead of treating these children as dummies, we do just the opposite," says an official.

Les Crawford, superintendent of the Roseland School District in Santa Rosa, California, says the process of change is difficult, "because it requires a great deal of time, energy and hard work. Decision making in a group process is slow and time consuming."

However, the results appear to be worth the effort. As teacher Vipi Dorland at John Muir says: "I'm seeing things I never expected to see." Henry Levin would be pleased but not surprised. As he never tires of preaching, the accelerated school program is likely to produce some very powerful learning.

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NEW STANLEY ELEMENTARY SCHOOL
KANSAS CITY, KANSAS

"You don't get well-developed professionals with two in-service days a year."

New Stanley Elementary School in Kansas City, Kansas, is typical of many urban elementary schools—two-thirds of its 360 students are from minority backgrounds (African-American, Asian American, and Hispanic) and 75 percent of its enrollment qualifies for free or reduced-price lunches.

With the help of a grant from the RJR Nabisco Foundation's "Next Century Schools" program, the school developed an innovative blueprint for learning that extends the school year, provides for a longer school day, groups teachers with the same students for several years, and encourages teacher collaboration.

At the heart of the effort: high expectations for all students, backed up by innovative approaches that combine the best features of the Effective Schools movement, theories of student effectiveness and autonomy developed by the Efficacy Institute and Dr. Jeff Howard at Harvard University, and the pioneering work of Yale child development expert James Comer.

Among the features that help the school work: New Stanley is on a nontraditional year-round school calendar. Students attend school on 60/20 tracks with 20 additional intersession days, totaling 200 student days a

year. Built into this schedule is a two hour block each Wednesday afternoon for teacher training, team planning, and collaboration. "You don't get well-developed professionals with two in-service days a year," says Principal Donna Hardy.

Teams of three teachers are responsible for the instruction of students for two-year periods. Teachers and students get to know each other. Johnny's reading problems or Towana's attention difficulties do not have to be rediscovered in class next year and the students have a chance to develop a lasting relationship with an important adult. To meet the needs of working parents, New Stanley offers breakfast; before- and after-school programs such as day care, which include tutoring and enrichment; and recreation.

According to the school's staff development director, "the restructured school year is not the most significant thing about New Stanley." That may be so, but what the extra time buys is an extraordinary amount of professional staff development.

Does any of this make any difference? So far the signs are encouraging. In justifying these changes, the school district guaranteed that all students entering middle school who have attended New Stanley for at least three years, would perform at or above grade level. To date, the warranty has been kept.

Equally impressive, when funding from RJR Nabisco ran out, the district picked up the extra costs of maintaining the program at New Stanley and many of the concepts at New Stanley have been implemented in other schools in the district.

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PARK VIEW OPTIONAL YEAR-ROUND SCHOOL MOORESVILLE, NORTH CAROLINA

"You get beginning-of-the-year enthusiasm and end-of-the-year relief four times a year!"

The list of potential advantages and disadvantages of year-round programs published by the Mooresville School District looks familiar and safe. Nothing here to get too worried about; nothing to cause too much excitement. Only slowly does the penny drop: Most of the advantages benefit children and their families; the disadvantages are largely inconveniences for adults, most of them in the school system.

Among the advantages cited by the district:

- students forget less during three short breaks than during a long summer vacation;
- less stress and burn-out for children and teachers;
- parents can take advantage of year-round care for their children;
- families have greater flexibility in vacation plans, often at less cost;
- grade retention can be reduced and remedial instruction provided during the year, rather than during summer school; and
- discipline problems, absenteeism, truancy and vandalism can be reduced.

Perhaps the best advantage of all, quips Roger Hyatt, principal of the Park View Optional Year-Round School, is that, "You get beginning-of-the-year enthusiasm and end-of-the-year relief four times a year!"

What about the potential disadvantages? There are several:

- family habits may be disrupted;
- teachers may find it difficult to attend college courses during summer days;
- parents with children in different schools may have to deal with two different school calendars during start-up years;

- some organized recreational programs are available only during the summer;
- tradition is violated with the loss of long summer vacations; and
- administrators, custodians, and secretaries face extra pressures since communication with teachers and students in regular and year-round schools is more complicated.

Nevertheless, it is hard to avoid the conclusion that the potential benefits to families and children far outweigh the potential inconvenience for adults and school personnel.

Mooresville is an interesting community and Park View a good example of what the district is trying to accomplish.

The community is located a few miles north of Charlotte, North Carolina, a city district located within a larger county school system. It enrolls approximately 3,000 students from kindergarten through grade 12.

Mooresville adopted a "one-step-at-a-time" approach to year-round education. The year-round calendar was implemented gradually, beginning with the lower grades. It is now being implemented through the 7th grade level, meaning that all district K-7 students can now take advantage of year-round programs on a voluntary basis. Parents are offered a traditional calendar, combining 180 days with a long summer vacation, and a year-round calendar (45 days in school alternating with 15 days off) in the same school.

The results are interesting. In the two elementary schools (including Park View) and one intermediate school offering both calendars, only one-third of the parents initially chose the year-round program. Today, two-thirds of the parents have opted for year-round education for their children. Significantly, teachers and teacher assistants for the year-round programs were also selected from volunteers. No teacher is forced to adapt to the new schedule. In fact, Mooresville reports that more teachers volunteered for the year-round program than could be accommodated.

Key elements of the program at Park View include before- and after-school care and extended-learning opportunities during the 10-15 day intersessions. The extended-learning programs include both remediation and enrichment activities. And they also include developmental care offering a variety of interesting activities—students can take advantage of golf clinics sponsored by a local professional; enjoy art classes oriented around animals and nature; or camp out at a lake in an environmental education adventure.

"The old calendar was a lot easier on us. But I know the new calendar is a lot better for most of these kids," says principal Roger Hyatt.

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PONDEROSA ELEMENTARY SCHOOL SUNNYVALE, CALIFORNIA

Sometimes being a little off-track winds up in derailment.

What happens to children who drift off-track in school? Perhaps they have trouble with their colors in kindergarten. Or their letters and numbers are a little mixed up in first and second grades. As most parents know, many children wander a little off-track from time to time, and most of them get straightened out.

But students who have trouble getting straightened out often hang on in school by a thread until they enter the middle grades and high school and find that it is all too much for them.

For 25 years, fifth-grade teacher Michael Goltzer worried about this second group of students in his Silicon Valley community in

California. The initial signs were often so subtle that no one paid attention. But the end result was a disaster.

Driving past his empty Ponderosa Elementary School one summer, Goltzer realized it sat empty three months a year and "the penny dropped." He knew what he could do for those students.

The end result is Project HELP, High Expectations Learning Program, an effort to make sure that drifting off-track early does not lead to derailment later.

With the leadership of then-Congressman Tom Campbell and contributions from some 60 Silicon Valley firms, Michael Goltzer created a program that works. Each year, elementary school students are tested and evaluated by their teachers to determine which children are at risk. Then about 65 students a year attend summer school for six weeks to receive individualized instruction in basic skills.

To reinforce what they learn during the summer, the following year the students are enrolled with the same teacher, a process that helps eliminate dislike of schoolwork, competition with other students, and fear of failure.

A key feature of the program, according to Goltzer is, "Only the best teachers are enlisted. That helps the teachers' bank accounts and drives up the kids learning curves."

Another key feature, and perhaps the most powerful one is that parents are required to show up at least once a week for a teacher-parent conference and parents have to agree to help their child with homework for 45 minutes a day, Monday through Thursday. "The biggest impact is on the kids," according to Goltzer. "They know their parents know."

Students participating in the 1992 summer session demonstrated impressive results. In the six-week program, reading, language, and mathematics skills jumped 20 percent, bringing many of the students from below national averages to, or above, national norms. "Kids are saying, 'I can do this.' And that's very powerful," says Goltzer.

Above all, he argues, intervention arrives far too late by the time students reach high school. Relationships with parents and teachers are often frayed beyond repair. Peer pressures kick in. Students are too far behind. But in the early years, approval from adults means more than the approbation of peers and a little help can go a long way.

Quantum Corp. founder David Brown sees Project HELP as part of the larger educational reform movement. "The extended school year, enhanced professional opportunities for teachers, accountability and school-based management are all a part of Project HELP."

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SAHUARITA ELEMENTARY SCHOOL
SAHUARITA, ARIZONA

"Seize the opportunity to involve community volunteers and technology to increase student achievement and productivity."

The senior citizens of Green Valley, a retirement community neighboring Sahuarita, are a valued resource. They are being utilized to promote student productivity and learning. One group in particular, the members of the Green Valley Computer Club, spend 25 hours every week helping students at Sahuarita Elementary School (SES) learn to use computers. The average age of these volunteers in 70+ and they are all retired! Most retirees do not dream of spending their time teaching young children complicated new skills. The volunteer program at SES has given the seniors a link with the youth of tomorrow, and the students think their senior mentors are "wonderful."

In 1979, SES principal, Mrs. Harrington,

envisioned a computer lab as a means to promote technology in education and to enhance learning. She enlisted the support of the community enrolled in the Safeway, "Apples for Students" program. This program earned the school the computers, printers, and software needed to begin a computer lab. The school district provided a classroom and an aide to support the computer lab. The Green Valley Computer Club, whose membership swells to approximately 800 during the winter months, took the initiative to start a volunteer program to staff the computer lab and assist students in learning computer skills. They expanded their interest and wrote grants to obtain additional monies to network the computers and to purchase additional materials for the lab. The Green Valley Computer Club recently received the national REACH award for their volunteer efforts in public schools.

The Green Valley Computer Club volunteers assist in teaching computer skills to over 550 students in grades K-5. The program provides students 20 to 40 minutes each week for learning to operate computers, keyboarding drills, creative writing, geography, spelling and math fact drills, graphic arts, and commercially produced education games. The volunteers act as mentors during the regular class hours, helping students through assignments and offering personal guidance and attention. They have been instrumental in getting members of the community to donate computers and printers to be used in the individual classrooms.

Recently, the Green Valley Computer Club volunteers have begun working as mentors to the teachers. They advised the teachers on the different applications of computers to complement the work that is in progress in the classroom. They have developed a basic math facts program which drills students and provides immediate feedback and praise. The volunteers are providing workshops for teachers to learn to develop "template programs" to create tests that are related to regular classroom assignments. The test will be self correcting in that it will provide the teachers with a score and test grade (percentile, letter, or descriptive grade). The test will provide the students with feedback, praise, and suggestions for further study.

Mrs. Harrington believes that Sahuarita Elementary is using its resources to enhance student learning. She states, "This includes seizing the opportunity to involve talented, senior citizens to interact with the youth and leaders of tomorrow while implementing technology to increase student productivity, enhance student achievement, and expand learning time."

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CHAPTER TWO

MIDDLE SCHOOLS AND HIGH SCHOOLS

ACCELERATED LEARNING LABORATORY: A CO-NECT SCHOOL WORCESTER, MASSACHUSETTS

"Reform that does not allocate actual time remains a barren expression of want."

When the New American Schools Development Corporation (NASDC) in 1991 invited "dreamers and doers from all walks of life... [to] assume that the schools we have inherited did not exist, and design an educational environment to bring every child... up to world-class standards," a team assembled by Bolt Beranek and Newman (BBN), Inc. accepted the challenge—including the restriction that the new design should cost about the same as the inherited model. BBN specializes in large-scale applications of telecommunications technologies, and its team became one of 11 winning bidders in a NASDC competition that produced nearly 700 proposals.

BBN and its partners proposed to design a new educational environment, the Co-NECT School (the acronym is pronounced "connect" and stands for Cooperative Networked Educational Community for Tomorrow) which is now being implemented and tested in two schools, including Accelerated Learning Laboratory, before being "scaled up" nationwide, perhaps as early as 1995.

The Co-NECT concept and Accelerated Learning Laboratory both incorporate technologies as a critical design element. But the concept extends far beyond technology. The Co-NECT effort addresses the latest strategies of the national education reform movement—national standards and the need for systemic (comprehensive) reform—and it incorporates new thinking about performance assessment, student grouping strategies, staff development, and school-site management in its plans. Co-NECT, as it developed during a two-year planning phase, is, in the words of its designers:

> *at once systemic and flexible. The design is systemic in the sense that it views schools as complex systems, embedded in systems still more complex. Innovations in curriculum and instruction, assessment, school governance, professional development, and use of technology are seen as part of an interconnected process of change, involving all aspects of life in the school ... At the same time, the design is flexible in the sense that these connections are intentionally loose ... The local curriculum is informed by emerging national content and performance standards, but not dictated by them.*

The Accelerated Learning Laboratory incorporates key elements of the Co-NECT design: a project-based curriculum emphasizing interdisciplinary projects, meaningful products, and involvement in seminars and workshops; performance assessments organized around individual and school goals, with individual assessment tied to emerging standards in key content areas; multiage clustering of approximately 100 students and four or five teachers to encourage long-term relationships between teachers and students and their families; modern technologies to connect and integrate all features of the design, including supporting the project-based curriculum and linking the school community to a rich variety of local, nation-

al, and global learning tools; and school-based design engaging local communities.

The Co-NECT design is offered not as a template but as a continuing process of goal setting, evaluation, and reflection. Three questions lie at the heart of the process: Where do we want to be? Where are we now? How do we get there?

Schools interested in the design are asked to address many issues. One of them is scheduling: What does an average day (or week or year) look like in a Co-NECT school? How is time organized to accommodate projects, seminars, personal pursuits and other learning opportunities? The Co-NECT design team offers no final answers to questions such as these, but it does suggest some guidelines:

- Sufficient time for projects must exist during the school day—at least two hours a day for middle-school children; more time, or less, may be required for younger students.
- Projects should extend over a period of weeks—perhaps six to eight.
- Time for collaborative planning and professional development for teachers should be built into the normal school day.
- Time for personal growth conferences should be part of the school year calendar for the teachers.
- The social and developmental needs of children need to be recognized within the daily schedule.

"Weaving these guidelines into the real lives of students, teachers and other adults is as important as reflecting educational priorities in the real world of educational budgeting," says the design team. "Unless and until they are translated into actual time allocated for the purposes claimed, they remain barren expressions of want."

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BEACON HIGH SCHOOL
OAKLAND, CALIFORNIA

To make a difference, break the rules.

Students at Beacon High School in Oakland, like their younger peers at Beacon Day School, have a school year that never ends and a 10-hour school day. The major difference in the schedule is that high school students are expected to attend school for only 215 days. Other than that the schedule is identical: the school is open from 7:30 a.m. to 5:00 p.m.; teachers work flexible schedules for 210 days; two teachers are on leave every six weeks, their places taken by "flexes."

Beacon High School's aim, according to codirector Thelma Farley: "We're trying to develop an effective, motivated person—a lifelong learner." While all students are required to cover such basic subjects as English, math, history and science, not all have to cover them in the same way. One student may need to take a writing workshop; another can prove competence in writing and spend extra time working on calculus, chemistry, or world history.

"You do it until you get it right," says Farley. "This system gives you the time you need, but it doesn't hold you back."

"Rules get made up by somebody for some reason, but they can always be changed," says cofounder Leslie Medine. "You can always find someone somewhere in the system who is willing to be different."

Beacon High School is just getting off the ground. Beacon Day was founded in 1982; the high school in 1991. The high school has an enrollment of 65 students and expects to peak at an enrollment of 250.

Medine and Farley go to great lengths to emphasize that the developmental perspective that undergirds the day school applies to the high school as well. They stress that although adolescents, like young children, grow and change in predictable ways, patterns of individual development vary. A developmental high school, they believe, is needed to make learning relevant to the unique perspectives of adolescent learners, each of them experiencing a period of

intense physical, emotional and intellectual change.

At Beacon High, classes are two hours long and structured variously, emphasizing hands-on activities, group discussions, films, breaking up time and giving students a break to relax. "A visitor might think some of these kids are hanging out," says Medine, "but this is how adolescents learn."

The school program emphasizes four major components:

- Core skills curriculum—emphasizing literacy, numeracy, arts and sciences, cultural knowledge and citizenship, critical thinking and problem solving, and health and fitness.
- Integrated studies curriculum—modules designed to help unify the knowledge, skills, and attitudes of each of the six core areas.
- Advice and mentoring—aimed squarely at preventing teenage alienation, an intensive, accessible guidance system uses teachers as advisors and mentors to help students develop the personal and interpersonal skills they will need to become fully effective adults.
- Experiential studies—over four years each student participates in several experiential living and working settings, teacher supervised rehearsals for life beyond school.

This school's program predates the advice of the National Education Commission on Time and Learning: "Reinvent schools around learning, not time."

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CARL SANDBURG INTERMEDIATE SCHOOL ALEXANDRIA, VIRGINIA

"I can concentrate better here than at home."

When nearly 1,000 seventh and eighth graders explode out of Carl Sandburg Intermediate every day at 2:40, about 70 students remain behind for Project Achievement—and most of them seem to like the experience.

In a darkroom, seventh grader Idil Abrahim enlarges some pictures she had taken the week before and reports that she likes the unstructured nature of the program, tutoring, study groups, and special activities, for two hours a day, three days a week.

"I like Project Achievement because I can concentrate better here than at home," says Idil. "I used to have trouble in math, but my grades are better now that I can ask questions during our study groups."

Started in 1992, Project Achievement provides both academic and social support for at-risk students after school. It is designed to extend the amount of time students spend on instruction and development with supportive adults by as much as 30 percent a year, and school officials report better grades, improved goal-setting and time-management skills, greater commitment to the school, and better attitudes toward learning on the part of students.

The program is in two parts, Sandburg received an RJR Nabisco Foundation Next Century School Award to mount the project in 1992. A six-week summer program helps prepare students for a successful start to the school year. It focuses on developing basic academic skills, encouraging personal accountability and goal setting, and fostering a sense of membership in the school community. It runs for six hours a day, four days a week, for six weeks.

Judy Drew Fairchild, director of the project, says that the summer curriculum is "a vigorous, nontraditional approach to learning. All lessons revolve around the theme of "investment," stressing the fact that an individual must invest time and effort in order

to reap rewards." One summer emphasized "Investing in the Environment" and encouraged students to explore open-ended questions such as: What structures does society create to protect certain environments? What responsibilities do individual citizens have to abide by the rules of society? By the end of the summer, students were expected to apply this approach to their school.

The after-school programs during the year help maintain the momentum. Project Achievement combines intensive work in reading and writing with goal-setting and personal skills development. Special activities, including quilting, arts and crafts, publishing, recycling, theater arts, sign language, shop, passport to the world, and fitness and recreation, offer students "exciting and active ways to approach learning that take advantage of student energy and curiosity," according to Fairchild.

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FAIRDALE HIGH SCHOOL
FAIRDALE, KENTUCKY

Creating a flexible system to target time and teachers on students as needed.

Fairdale High School in Kentucky is a magnet career academy specializing in fire sciences, emergency medical services, law enforcement, legal and medical office technologies, and radio electronic communications. It is also a member of the Coalition of Essential Schools, a reform network of more than 150 member schools in 30 states. The Coalition was established in 1984 by Theodore Sizer at Brown University to redesign the American high school for better student learning and achievement.

Fairdale has committed itself to the nine "Common Principles" of the Coalition of Essential Schools. The principles are a broad call for schools to set clear and simple goals about the intellectual skills and knowledge to be mastered by all students; to lower teacher/student loads, personalize teaching, and make student work the center of classroom activity; to award diplomas based on student exhibitions of their work; to develop trust and respect among all the school's constituencies; and to do all of this with no more than a 10 percent increase in school budgets. The principles, in brief, are these:

1. The school should focus on helping adolescents learn to use their minds well.
2. The school's goals should be simple, for example, that each student master a limited number of essential skills and areas of knowledge.
3. The school's goals should apply to all students, while the means to the goals should vary as students themselves vary.
4. Teaching and learning should be personalized.
5. The governing practical metaphor of the school should be student-as-worker, rather than the more familiar metaphor of teacher-as-deliverer-of-instructional-services.
6. Students entering secondary school studies are those who can show competence in language and elementary mathematics.
7. The tone of the school should explicitly and self-consciously stress values of "unanxious" expectation, trust, and decency.
8. The principal and teachers should perceive themselves as generalists first and specialists second.
9. Administrative and budget targets should include substantial time for collective planning by teachers, competitive salaries, and per-pupil costs not to exceed that of traditional schools by more than 10 percent.

As part of its restructuring effort under the Coalition banner, Fairdale has spent a lot of time worrying about how to use time. Fairdale provides:

- a daily 25-minute advisory period during which students receive tutoring, guidance, and personal attention;
- three ninth grade "collaborative learning community arrangements" in which five to seven teachers assess, schedule, and evaluate 130 students—a flexible system to target time and teachers on students as needed;
- joint programs (tech prep) with nearby Jefferson College to permit Fairdale students to earn two-year associate degrees;
- service learning as a graduation requirement;
- student and teacher networking with other restructuring high schools; and
- creation of a pilot "house"—400 students (9th through 12th grade), 27 teachers, a counselor and an assistant principal—to personalize education within a more autonomous, self-contained unit.

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INDEPENDENCE HIGH SCHOOL COLUMBUS, OHIO

"We are convinced we are making a difference for our kids."

Independence High School, one of 17 high schools in the Columbus public school system, is an urban high school in transformation. About one-third of Columbus schools have been designated as "site-based" or "shared decision-making" schools, and Independence is one of them. At the very core of the school's transformation is a complete rethinking and redesign of how available school time is used.

Independence is typical of many urban high schools. About 950 students attend the school, and minority students make up nearly 60 percent of enrollment (54 percent of the students are bussed for purposes of racial balance). About 30 percent of the 1992 graduates attended a college or university (including community colleges) immediately after graduating.

At the beginning of ninth grade, one-quarter of all students typically pass the state proficiency examination (required to obtain a diploma); by the end of the year, more than one-third have passed. Among the professional staff, both teachers and administrators, 45 percent have taught at Independence or elsewhere for 20 or more years.

In 1989, a school board task force recommended that the board should give some high schools, "Scout Schools," much greater responsibility to discover and shape, within a local context, creative and responsive solutions to the education challenges of the 1990s. Each high school was invited to submit a comprehensive plan for reform based on an agenda developed by a school task force, and in May 1989, Independence was one of five high schools in Columbus receiving the coveted "Scout School" designation.

Independence operates with the assistance of a Shared Decision-Making Cabinet (SDMC) made up of administrators, teachers, staff, parents, and students. The SDMC meets monthly to consider policy issues; program concerns, including curriculum, achievement and testing; staff allocation; budgets; and long range planning. To date, the SDMC has approved programs for teen assistance, attendance incentives, academic awards, student government, and in-school suspension. In addition, a comprehensive professional development program supports and updates staff.

How does time fit into the picture? Long before site-based management, school staff were concerned that student achievement

was below average, student dropout and failure rates were rising, and discipline referrals, absenteeism, and truancy were increasingly a daily problem. As the SDMC developed new programs, according to school staff, it became apparent that these were add-on programs, and though somewhat successful, did not address the fact that school as we "know it" and "do it" is not meeting the needs of our students.

"We also came to realize that in the present structure and under the existing circumstances of up to six classes/180 students per day, staff can do little in the way of developing creative solutions to the myriad problems faced on a daily basis. For most of the staff, daily survival in the face of student apathy, absenteeism, truancy and so on leaves little or no energy for becoming involved."

Hence the SDMC took the critical step: with the support of the superintendent, the reform task force, and the school board, SDMC developed "PROJECT TRI," a plan to divide the school year into three trimesters and restructure the entire school day. Implementation began in September 1992.

PROJECT TRI divides the school year into three 60-day trimesters and organizes the school day into three two-hour instructional blocks. Academic classes meet for two hours each day for 12 weeks for a total of 120 hours of credit that meet Carnegie unit and Ohio requirements.

A key feature of the plan is that a teacher will usually teach two blocks each day. This reduces the typical academic teacher's daily class load from six classes and 180 students a day to two two-hour classes with just 60 students each day. Over the three trimesters, of course, the teacher still conducts six classes a year (involving 180 students). Nonacademic subjects (defined as unified arts, vocational and career programs, music, newspaper, yearbook, physical education and health) continue to be scheduled for one hour each day for 12 weeks.

Among the benefits that Independence High School expects to gain from the plan are the following:

- greater opportunity for individual instruction;
- greater coherence in learning as students deal in depth with three classes a day instead of six and find they can more easily plan for a 60-day trimester than a 180-day year;
- ninth graders can complete proficiency requirements before they have to take the test;
- teachers can pay more attention to individual students and to parents since they will be dealing with fewer of them in any given trimester;
- parents will be able to focus better on their student's progress and receive the benefit of more frequent communication from teachers;
- more time on task because of fewer interruptions and class changes;
- elimination of classroom preparation for up to four classes a day for each teacher; and
- the use of teacher duty periods for enrichment, remediation, and cross-curricular planning time.

Is it working? So far signs are good, according to project coordinator Beth Carnate. Student failure rates have dropped from 25 percent per course to 15 percent, she says. About 15 percent of all students made the honor roll in the old nine-week grading period; the proportion has increased to 40 percent or more in the new three-week grading period (students now receive reports every three weeks). "We are now completing our second year and are convinced we are making a difference for kids."

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JAMES A. FOSHAY MIDDLE SCHOOL
LOS ANGELES, CALIFORNIA

"God forbid a school should do something on its own."

Howard Lappin of Los Angeles' James A. Foshay Middle School provided the Commission with a solid example of a multitrack "year-round education" program in operation.

Foshay sits on the edge of the South Central Los Angeles region that suffered the worst damage during the civil disturbances that broke out in 1992 following the verdict in the intensely watched trial of the police officers accused in the beating of Rodney King. Visitors to the school cannot help noticing the metal bars protecting practically every home, business, and church in the neighborhood, the 8-by-15 foot chain-link fence shielding the school from its surroundings, and the guard at the school door. Visitors cannot help noticing something else too: inside, the school is an island of tranquillity. The school is clean. The atmosphere is relaxed. Occasional groups of students in the hall are alert and polite. Classes are focused on academic work. "We demand a lot from these kids," said Lappin.

Despite fires near the school during the riots in 1992, and the presence of a gang in a house across the street, "Here in this school, the students are safe. And they know they are safe," said Lappin. "On the streets, they are worried."

Lappin described his efforts to turn Foshay around since arriving as principal four years ago. Until recently, he said, the school enrollment was 90 to 100 percent African American. Today, two-thirds of the enrollment is Hispanic, with 50 percent of the students classified as having "Limited English Proficiency." "You can tell what is happening in Central America based on how our enrollment changes from month to month," said Lappin. "Just in the last two weeks, 50 new students enrolled, and we have an 80 percent transience rate annually." Three-quarters of the students' families qualify for public assistance, and 97 percent of those enrolled come from low-income families.

When Lappin arrived at the school, Foshay was one of 31 schools in the state defined as "at risk," that is, the state was threatening to take away its Chapter 1 and bilingual education funding because the achievement of its students was so low: on a scale of 1(low) to 100 (high) in California standings, Foshay stood at 2. Its language and mathematics achievement scores on the California Test of Basic Skills (CTBS) were in the 15 to 20 percent range. The dropout rate annually reached 21 percent. Today, Foshay is not on the "at risk" list; its language and math scores on CTBS reach 30 to 40 percent, respectively, and the dropout rate has fallen to 5 percent. The principal and his multicultural staff are clearly proud of what they have accomplished.

Lappin captured the difficulty of changing an individual school within a larger school bureaucracy with the phrase, "God forbid a school should do something on its own." A year-round calendar is only one aspect of Foshay's turnaround, he said. Foshay has also implemented school-based management and has successfully competed for one of 130 state grants for school restructuring, succeeding among 800 applicants. "But despite our effort to restructure and the fact that we are a site-based school," he complained, "our school site committee has almost no control over the school's budget. And we really have no control over our staffing—the district hires teachers district wide. We are eligible for what Chapter 1 calls 'schoolwide projects,' but the district will not approve it."

Despite such difficulties, the Foshay staff persevered. Included in the turnaround were several factors: an emphasis on order in the school, site-based management efforts in which Lappin and the staff make decisions about the school jointly; restructuring; and a year-round/multitrack calendar. The year-round effort has, in essence, created four separate schools within Foshay's walls. Each of four tracks begins and ends at a different time of the year so that, although students normally spend only 180 days at school, the school facility is used year round. Inter-sessions between school semesters permit students to receive an additional 60

hours (ten days) of instruction if needed.

Moreover, the school operates some Saturday classes for both students and parents, including a joint effort with the University of Southern California. The "Neighborhood Academic Initiative" enrolls 60 students who are guaranteed full assistance to attend the University if they persist and complete the Scholastic Aptitude Test with combined scores of 1000. The joint program requires mandatory Saturday classes for the students and their parents. With the assistance of USC, Foshay is also opening a social service center on campus to provide health care screening, pediatric care, a dental van and visits from professionals affiliated with the School of Social Work.

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JAMES P. TIMILTY MIDDLE SCHOOL
ROXBURY, MASSACHUSETTS

"Now I come home from work and he is already studying."

Four days a week, students at James P. Timilty Middle School, in the middle of Boston's low-income Roxbury neighborhood, spend 90 more minutes in class than any other Boston public-school student. In addition to its extended-day program, Timilty also offers an anti-violence program and a comprehensive academic curriculum. In 1989, Timilty was cited by the U.S. Department of Education as an exemplary school, in large part because of its extended-day program, PROJECT PROMISE.

Timilty did not always get rave reviews. In the early 1980s, it was considered one of the worst schools in Boston. Suspension rates were high. Test results were low. Instead of winning national awards, it was labeled a problem.

But with PROJECT PROMISE, attendance rates have increased, test scores in mathematics and reading have improved, and suspension rates have dropped dramatically.

A citywide magnet school, Timilty is open to any Boston public-school student. Ethnically diverse, most of its 580 sixth-, seventh-, and eighth-graders come from low-income backgrounds. It is the most frequently selected middle school in the city, according to principal Roger Harris who says: "We try to make learning fun. I insist that students experience success."

Parents like what they are offered. Parent Natalie Carithers said that when her son was in sixth grade she had trouble getting him to study. "Now, when I come home from work, he is already studying, and he is studying all the way until his homework is done."

Students are expected to do writing assignments in every class. In fact they are expected to submit seven writing projects a month, says Harris. Moreover, Timilty involves the community in its writing program through a unique pen-pal program, Promising Pals. Students write at least four letters to people with interesting careers in Boston. Then they and their pen pals meet for the first time at a breakfast reception in the spring at the school.

Reading is also serious business at Timilty. The class day ends with DEAR (Drop Everything and Read), a 15-minute period during which all people in the building, including secretaries and janitors, put aside whatever they are doing and read silently to themselves. During the extra 90-minute periods from Monday to Thursday, half the time is devoted to reading and half to a mathematics class. Every student experiences two math classes and two reading classes daily.

And the school takes computers seriously as well. In the promotional materials made available to parents as part of the city's choice plan, the school stresses that is has "lots of computer education," including an

IBM lab, TEAMS/Telecommunications for math and science, MACINTOSH lab, and "lots more."

Undoubtedly Timilty students take a ribbing from their peers in schools with regular class schedules, but they do not appear to pay much attention. "I think we get to learn more and the teachers make it more fun," said Massie Lle, a sixth-grader.

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NORTH BRANCH HIGH SCHOOL
NORTH BRANCH, MINNESOTA

Meeting the needs of student, family, and society in the information age.

North Branch High School in Minnesota, with the blessing of the state legislature, is in the midst of implementing a new 12-month education program designed to meet the needs of students, families, and society in the information age, expand use of school facilities, and create new scheduling options for students.

Students can attend school year round (and complete high school sooner), choose any three of four sessions throughout the year (completing high school in the normal four years), or attend school part time, in any combination of sessions (completing high school on their own terms and their own schedule).

North Branch officials believe the new schedule will offer benefits to many different kinds of students. Students who want to accelerate their education can do so. Those who wish to explore additional areas of the curriculum can now find the time. At-risk students with special requirements can slow their schedule down, or make up graduation requirements. Athletes now have the option of adjusting their schedule during sports seasons so that they do not become overextended. Dropouts and employed students can adjust school to their life outside school. And, parents will have new options for scheduling vacations.

In planning for the change, the school has paid a lot of attention to the nuts-and-bolts of school administration that frequently impede innovations of this sort.

Funding. North Branch fully expects that students attending more than three terms in any year will generate more than one full-time-equivalent (FTE) student for funding purposes in that particular year—but will not generate more than four FTEs by graduation time. Once the program has stabilized (when the first class of students enters its senior year) the level of FTEs should average out. The new schedule does not generate additional funding; only the timing of the funding changes.

School Year vs. Fiscal Year. To meet state requirements that the first day of school start after Labor Day, the summer term must run from June to August—extending from one fiscal year to the next. North Branch officials suggest deferring June expenses and attendance data into the next fiscal year.

Maximum Length of School Year. The school is asking for a waiver of Department of Education regulations specifying that the school year cannot exceed 220 days. The 12-month program entails 230 or more days.

Transportation. Since regular per-student transportation entitlements are based on costs of the traditional school year, North Branch has asked that transportation costs for the additional term be classified as nonregular transportation.

Staffing. School officials plan to provide administrators and teachers for the 12-month program in accordance with contractual agreements and existing administrative procedures.

Postsecondary Enrollment Option. Existing options to permit students in 11th and 12th grades to enroll for credit in post-

secondary programs will be honored. A simple clerical task is required to note when a student actually enters 11th grade.

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PARRY MCCLUER HIGH SCHOOL
BUENA VISTA, VIRGINIA

"A good way to introduce an extended school program is to begin with the word voluntary."

"Secondary schools have a lot in common with graveyards," James Bradford, superintendent of schools in Buena Vista, Virginia, likes to say. "It's hard to change or move a graveyard. And it's hard to change a secondary school, too."

But 20 years ago, the Buena Vista superintendent and school board began changing their secondary school calendar and they are still proud of the results. Starting from the premise that they wanted to achieve standards of educational excellence laid out in newly adopted "Virginia Standards of Educational Quality," the district implemented an extended school year of 218 days (180 of them mandatory for all students) divided into four quarters.

The regular school year is divided into three sixty-day quarters and a fourth quarter is offered, on a voluntary basis for both students and teachers, during the summer. The summer quarter provides enrichment, acceleration, and promotion. It is tuition-free and includes regular bus transportation.

"A good way to introduce an extended school program is to begin with the word voluntary," says Bradford. "Your plan may be in trouble if you announce the program as mandatory. If you mandate the year-round schooling without prior planning and justification, your parents, teachers and students are going to rise up in arms."

Bradford reports that Buena Vista approached school improvement from the point of view of "what would be best for the children in an industrial community with a student population that profiles the bell curve in ability. The aspirations of the people included economic development and maintenance of a viable city that would have no future if it were not for the maintenance and the recruitment of new business and industry."

When Buena Vista educators looked into what they needed to change, Bradford stresses, "The administration and teachers felt that the traditional semester system was outdated and did not meet the educational needs of the city's high school students."

The long effort to change the high school and involve the community in the process appears to have paid off. According to a ten-year follow-up study:

- more than 50 percent of high school students have consistently enrolled in the summer quarter;
- student achievement scores increased to a level that equals or exceeds national averages;
- faculty report that they accomplish as much, or more, during the summer quarter as in regular quarters;
- students report that they learn as much in the summer as during regular quarters;
- taxpayers have pocketed the savings resulting from students attending summer quarters instead of being retained for a full year;
- "an overwhelming majority" of faculty and students favor continuation of the four-quarter system; and
- students are given an opportunity to complete up to one year of college credits while in high school.

All in all, these are impressive results for a program that students take for granted. When the chairman of the Commission visit-

ed Buena Vista, one chemistry student told him that he could not understand why so many visitors and television crews visited the school. Until the commission chairman told him, the student did not seem to know that the four-quarter, voluntary, extended program at Buena Vista was almost unique in the state of Virginia. Sometimes the simplest ideas are the most powerful.

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PISCATAQUIS COMMUNITY HIGH SCHOOL
GUILFORD, MAINE

"Schools need to be changed community by community, school by school, and classroom by classroom."

Imagine a traditional high school principal and someone like Piscataquis's Norman Higgins is likely to come to mind. Conservatively dressed, hair neatly trimmed, carefully spoken, he believes that every high school student should be exposed to a common core of academic learning.

Looks, however, can be deceptive. Behind the traditional facade lies an education revolutionary who has turned his school upside down to improve learning, helped develop Maine's Common Core of Learning, and advanced many of the same ideas on the national stage through *Prisoners of Time.*

In 1989, worried about poor test scores and an increase in dropout rates in this isolated, low-income, rural area of Maine, Higgins and his faculty sought an $8,000 grant to implement a core curriculum in ninth grade. Armed with that success and a vision (Project 2000) of extending it throughout the school, Higgins sought major funding from the RJR Nabisco Foundation. Among the key elements of Project 2000:

- a common core of learning for all students;
- eliminating tracking;
- investing in computer technology;
- staff development during the summer;
- block scheduling during the day; and
- keeping the school doors open longer during the day to accommodate the education needs of working people and the unemployed.

"Schools need to be changed community by community, school by school, and classroom by classroom," says Higgins in his distinctive Maine accent. "This is a grass-roots effort."

The requirements at Piscataquis Community High School (PCHS) are rigorous. Students are expected to take particular courses and to gain particular information from each of them. Home economics and industrial arts are not offered at PCHS. Classroom desks have been replaced with tables for group discussion. Students design and build model bridges to integrate mathematics in their studies, talk to each other over computer and telecommunications lines, work in groups, or participate in a host of fine arts activities from band to drawing.

"What we have tried to do is increase the academic expectations for students," says Higgins. "All students now study Shakespeare, write poetry and essays, and take algebra, chemistry and physics. Within the core courses, we also have raised the expectations for performance so that we have eliminated those general, vocational, and business programs."

Each student is required to complete two years of wellness, three years each of mathematics and science, four years of English, two years of U. S. history, American government and world cultures, an introductory technology course, a word-processing class, a computer applications class, and fine arts.

Starting in 1993-94, all freshmen are required to take either Spanish or French.

The core curriculum is the focus of the academic day at PCHS. There are no home rooms and no activity periods. But long after the academic day ends, the school lights continue to burn in the school's classrooms. In the heart of a winter evening on the deserted streets of Guilford, when a visitor asks where all the people are, Higgins can reply without fear of contradiction: "They are all at the school."

Keeping the school open longer permits hundreds of adults in the Guilford area to earn associate's degrees or take one of many classes offered under an adult education program.

Students and adults in the Guilford area have been big winners in the PCHS makeover. But the biggest winners of all may have been the teachers, newly enthusiastic about the possibilities in their profession. Teachers at PCHS were paid to work on curriculum and planning for Project 2000 during the summers and vacations. Teachers now have access to an electronic mailing system, record grades electronically, and have begun using technology platforms for classroom presentations. The platforms permit teachers to use any computer program and project what they are doing on 27-inch television screens for student viewing.

"We have been asking teachers to restructure schools while also expecting them to be effective full-time teachers. We have been asking them to do two things at the same time, and that does not work very well," says Higgins in his matter-of-fact way.

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SALT LAKE COMMUNITY HIGH SCHOOL
SALT LAKE CITY, UTAH

Helping students succeed who are not making it in their home schools.

Four years ago, Salt Lake City school officials became convinced that the city needed an alternative high school program. Convinced that many families were no longer able to provide the support systems for their children that they had in the past, officials were concerned about increasing numbers of at-risk students in the schools. These students were often from single-parent families which moved frequently, requiring students to change schools. Many were failing, or dropping out, and increasing numbers were running afoul of the juvenile justice system.

Salt Lake Community High School was born—a system of small, neighborhood, "satellite schools" offering educational opportunities to school-age students, dropouts, and adults from the intermediate school level through high school graduation. The school is designed to meet the needs of students who are not succeeding in traditional school settings, and school-age students are selected based on referral from their home school.

With its emphasis on meeting the individual needs of students and preparing them for the world of work, the Community High School offers a wide range of programs, including intermediate and high school programs, adult education programs in both the day and evening, high school completion programs for young parents, including child care, programs for youth in custody, and a directed studies program for students unable to deal with regular schools or to attend during regular hours because of employment, personal, or family needs.

Salt Lake City administrators cite several advantages to the multicampus, "satellite" approach to providing alternative education. Open entry policies and small classes make it easier to meet the individual needs of students, and the students, themselves, have to travel shorter distances to find a suitable

program. At the same time, students benefit from working intensively with fewer teachers and other adult authority figures and in a generally accepting atmosphere.

Obviously there are some problems. The rotation of teachers and services through the four major sites can upset stability and some of the equipment and facilities leave a lot to be desired.

But the benefits far outweigh the problems. Each year, Salt Lake Community High School students and staff take part in two impressive events. The first is a commencement exercise at which students who have successfully completed the high school diploma are awarded scholarships to the postsecondary institution of their choice. The scholarships are funded by partnerships with local firms and service organizations. The second is an annual Christmas party at which students and staff serve a Christmas meal for the elderly and the homeless and Santa Claus passes out presents for children under the age of eight. In 1993, 800 people enjoyed the benefits of the Christmas program.

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SIR FRANCIS DRAKE HIGH SCHOOL
SAN ANSELMO, CALIFORNIA

"Students budget their own time based on the projects we're working on."

"Going to a movie is too demanding for some kids today; 90 minutes is longer than they can concentrate," muses Michelle Swanson a 16-year veteran of the classroom. Conventional teaching methods—lectures designed to load kids up with facts which they then spit out during tests—actually contribute to the boredom that many of today's young people experience, Swanson believes.

So in 1989-90, teachers in the Tamalpais Union High School District began developing an innovative, integrated studies program for some 200 students at Sir Francis Drake High School in Marin County, California—DISC, the Drake Integrated Studies Curricula. With initial support from the Autodesk Foundation, funded by the successful, Sausalito-based software company, Sir Francis Drake ultimately won a $708,000 grant from the RJR Nabisco Foundation.

"This is a new mousetrap, and it's working—more kids are learning," says Bob Baños, one of 12 teachers involved with DISC. The ultimate goals: integrate academic subjects; use technology as a tool rather than an end in itself; insist that students think critically and solve problems; encourage students to collaborate with each other. In short, DISC is everything that conventional, passive learning is not because it seeks to create students who are "self winders."

The curriculum has been restructured into three major areas:

- ROCK—(Revolution of Core Knowledge) blends 9th and 10th graders for science, English, history, visual arts, social issues, and state-of-the-art technology in a daily four hour block and encourages students to make connections between and among the disciplines.
- Survey of Engineering—a two-year block for 11th and 12th graders that includes physics, electronics, design, drafting, computer applications and other projects. The survey encourages students to solve real engineering problems (e.g., building model bridges) in teams.
- The Communications Academy—permits 11th and 12th graders to study history and language arts with a concentration in the performing and media arts: theater, video, and audio productions and computer-based interactive presentations.

Restructuring time was a major element of the effort to restructure curriculum, but just one aspect of a program that also included:

- freeing two teachers for a semester to plan the program;
- adding 17 days to the school year, increasing instructional time to 200 days;
- team teaching and common planning time for teachers;
- peer teaching and teaching technologies as integral aspects of the program; and
- restructuring time within the program—three normal school periods were combined into one block of time.

But the Drake experiment is also a lesson in the difficulty of making major changes within existing school bureaucracies. The enthusiasm of many students was nearly overwhelmed by implementation obstacles.

The school district, Swanson told the Commission, did not anticipate the needs or effects of Drake's efforts to extend the school year. The RJR Nabisco grant arrived just in time to surmount bureaucratic obstacles.

According to Swanson: "Vital functions such as the public transportation schedule (which changes to meet the needs of the public high schools during the regular year), cafeteria services, and school staffing were closed down." Custodians began their summer clean-up—which tore the school apart and reconfigured it.

"Everything on campus indicated to the students, 'the school year is over.' The kids were very clear about the message they were receiving: 'School's over for everyone but you and you have to go an additional 17 days because we say so. We don't really care enough to create the right environment for you, but we've decided you should be in school, so be here.'"

Scott Rostoni attends Sir Francis Drake and is enthusiastic about his work in the integrated curriculum. "It's hard to distinguish between work in school and homework because the students budget their own time based on the projects we're working on," he said. "Our projects have benchmarks which force us to think about how to use our time and also to think about broad ideas and information, not just isolated facts."

One of the program's exciting aspects is that it works for all kinds of students in the school—from the least well motivated to the high achievers. "We've gone out of our way to make this a non-elitist thing," observes Swanson, universally regarded as the "spark plug" of DISC. Communications Academy student Ava Ruley agrees: "DISC draws from all the groups on campus: football players, fringe kids, popular girls, computer nerds, 'homeys' . . . everybody's here."

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ST. PETERSBURG SENIOR HIGH SCHOOL ST. PETERSBURG, FLORIDA

The International Baccalaureate is unlike any other high school program in the United States.

Since its founding in 1963, the International Baccalaureate program has become an international symbol of academic excellence and integrity, and its graduates are widely considered to have unusual intellectual promise. International in scope, the main offices of the International Baccalaureate (IB) are located in Geneva, Switzerland, and the grading of final examinations in IB schools is conducted under the auspices of the Exams Office, located in Cardiff, Wales.

Only 550 accredited IB schools exist around the globe. One of those schools is located in Pinellas County, Florida, at St.

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Petersburg Senior High School, which likes to describe the IB program as unlike any other high school program in the United States.

Pinellas County enrolls 98,000 students, making it the 22nd largest school system in the country. St. Petersburg High School offers an IB Magnet Program, which selects students competitively (only one out of three applicants is accepted). Since its first full graduating class in 1987, the St. Petersburg program has consistently placed in the top 10 of all IB schools in the world in terms of the number of diploma candidates.

Students in the program come from diverse ethnic, racial, and economic backgrounds. School officials describe students in the program as young people searching for educational challenges who display increased intellectual self-confidence as they work successfully with college-level material in all courses. They become better at managing their own time and develop into expert learners and researchers through participation in such requirements as producing a 4,000 word research paper and "learning to learn" in a Theory of Knowledge course.

The IB course of studies is rigorous. Many observers believe that students who have completed it have completed the equivalent of the first two years of college. In grades 9 and 10, students are required to take a sequence emphasizing grammar, composition, and literature; Algebra I, II, Geometry, and Trigonometry; biology, chemistry, and physics; economics, government, and world history; two years of Spanish, German, or French; inquiry skills development; and fine arts, physical education, health, and practical arts.

Then the real demands begin. Grades 11 and 12 take English and continue a foreign language; history and/or psychology; advanced biology, chemistry, and/or physics; theory of knowledge; probability and statistics, pre-calculus, calculus, and discrete mathematics; a sixth IB elective: a special project of 150 to 300 hours of creative or social service; and an extended 4,000 word essay or research-based thesis.

Achievement in all International Baccalaureate courses is verified by three- to five-hour examinations in each area. Language examinations include an individual assessment of the candidate's oral competence by an external examiner. IB students are generally qualified to take Advanced Placement examinations across a broad spectrum of AP offerings. The result: graduates from the St. Petersburg program and other IB programs around the world are routinely offered admission to many of the best universities in the United States and elsewhere, often with advanced standing.

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THOMAS JEFFERSON HIGH SCHOOL FOR SCIENCE AND TECHNOLOGY ALEXANDRIA, VIRGINIA

Developing a new generation of scientists, scholars, and leaders.

No one can visit the Thomas Jefferson High School for Science and Technology, Alexandria, Virginia, without realizing it is one of the most remarkable public schools in the United States—remarkable for the talents of its selected students, the skill of its staff, the technologies it employs, and the support it receives from the school district and business community.

It is remarkable for something else as well. Its schedule is different; every school day at Thomas Jefferson is lengthened by one period, during which every one of its 1,600 9th to 12th graders is required to participate in a

student activity or related coursework such as tutoring, laboratories, or guidance activities. Daily schedules are also flexible enough to let classes meet for extended times as required. This arrangement also provides flexibility for professional development time for teachers.

The selectivity of the school—and corporate sponsorship of state-of-the-art technological environments in areas such as optics, energy systems, telecommunications, biotechnology, and industrial robotics—makes it easy to overlook the school's schedule as a factor in its success.

What does the extra period mean in practice? According to sophomore Paul Helms, "It is one of the most important things in the school. I use it to go to both the Fellowship of Christian Athletes and to a Latin Honors class." Senior Seth Mitcho: "Eighth period has helped make this school the center of our lives and often of our families."

The following statements express Thomas Jefferson's vision:

- The instructional program incorporates real-world technological experience into the curriculum with the establishment of 10 state-of-the-art technology laboratories.
- The teaching/learning environments encourage and nurture development of students as leaders, scholars, researchers, and practitioners of science.
- The bond between the school and the business/industry community is a relationship which assures a collaborative effort in the development, assessment, and continual updating of the school's programs.
- The school is a catalyst for revitalization of mathematics and science education by serving as a center for instructional innovations, curriculum development, teacher training, and enrichment programs for students who do not regularly attend the school.

All students complete a college preparatory program of 25 credits. A longer school day permits each student to complement the core curriculum with advanced placement courses, elective courses, mentorships, and extracurricular activities.

Fine arts are part of both the academic and activities program. Course work in the visual, musical, literary, and dramatic arts are complemented with cocurricular programs in the arts, with literary publications, art displays, dramatic productions, and musical performances.

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CHAPTER THREE

School Districts

LAKE COUNTY SCHOOLS
LEADVILLE, COLORADO

Providing day care and preschool programs amidst rural poverty.

Leadville, Colorado was in trouble when James McCabe assumed the superintendent's chair for its Lake County Schools (total enrollment of 1,100 students in a small rural valley of about 5,000) in 1987. The county's economic base collapsed when a local molybdenum mine shut down, throwing nearly 3,000 people out of work in a one-company town. Forced to drive 45 miles or more to Colorado's ski resorts to find work at half the wages, Leadville men and women began operating ski-lifts, selling tickets and ski equipment, and cleaning hotel rooms.

McCabe's solution was straightforward. Marry the need for day care with the equally pressing need for preschool preparation in this low-income community. Organizing a community team, he persuaded the school district to turn over an elementary school (renovated at a cost of nearly $250,000 funded mostly with Federal, state and county grants) which would be used for (1) an affordable preschool program for every 2 1/2 to 5-year old child in the county; (2) affordable day care for all children up to the age of ten (365 days a year from 5:30 a.m. to 6:30 p.m.); and (3) before- and after-school care for all 5- to 13-year-olds in the county—all without using any local property tax money.

The program at "the Center" snowballed. Originally intended for perhaps 100 students, nearly 700 students are now enrolled in its programs. The Center does not resemble a formal school in any sense. "Its curriculum concentrates on being a stimulating, nurturing place for children... on positive self-esteem, choices, and active learning, rather than on academics," according to a district 1992 evaluation.

Beyond the three original purposes, the Center also provides two meals and two snacks a day, preschool programs for students with disabilities (including nine students with severe and multiple handicaps), parenting programs and prenatal assistance, teenage pregnancy efforts, an "infants and toddlers" program (which now has a waiting list), child and family counseling, everything from music lessons to skiing instruction, and a wide variety of field trips, including a once-a-week ski trip for preschoolers.

These are impressive accomplishments for a facility with an annual budget of $600,000 that does not require local homeowners or renters to pay a single additional cent in property taxes. Lake County School District donated the building that houses the Center. McCabe used a $140,000 Community Development Block Grant, $40,000 provided by Lake County government, and $40,000 from the district to renovate the building, remove asbestos, and make the facility accessible to the disabled. Tuition and fees provide 50 percent of operational funding, and the difference is made up by the county's social services department, the state, Head Start, and business and philanthropy. "When they need to do something, they just go ahead and find the money and tell me later," McCabe says.

Equally impressive: the proportion of low-income families in the county appears to have declined from 51 percent to 28 percent. Part of the decline is explained by unemployed people moving from the county in search of work; but McCabe is convinced that it is partly because the Center

frees parents to work while remaining in the county.

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MURFREESBORO CITY SCHOOLS
MURFREESBORO, TENNESSEE

The extended day and year: one community's experience with public demand.

The Murfreesboro City Schools in Tennessee may have the most comprehensive extended-day and -year program in the United States. In 1986, Murfreesboro decided that community concern about latchkey children was strong enough to justify extending the school day.

In its initial proposal for an extended day pilot project at Hobgood Elementary School, Murfreesboro officials stressed several considerations:

- Since 1950, the proportion of mothers with school-age children working outside the home had increased from 26 percent to over 50 percent.
- The number of children left unattended in empty houses after school was alarming.
- Before- and after-school care programs should focus on meeting the developmental needs of the child.

The district announced that one elementary school (Hobgood) would be open from 6:00 a.m. until 6:00 p.m. with parents paying for the extended-day services. Four students showed up. Within two years, public demand forced the extension of the concept to every elementary school in the city. This year, 50 percent of the city's 5,000 elementary school students can be found in the program on any given day, all on a voluntary basis on the part of parents.

Wendy Day Rowell, a single mother, told the Commission that she had paid to keep her children in a babysitting and private day care situation for four years. She found it expensive, unstable, and generally unhealthy for her children and worried that her boys were "clingy and socially atrophied." The day care director blamed the behavior on Ms. Rowell's divorce from her husband—although she did not put it quite that way but spoke instead about the "broken home syndrome."

In tears one morning, Rowell contacted the extended school program at 6:00 a.m., and the site director placed the children in an already full summer program. From the first day, Rowell smiled, her sons blossomed. They went swimming, skating, explored karate, Spanish, guitar and violin, and helped make a Christmas album. "The staff stuck with me through good times and bad," said Rowell. "Once when I was unemployed and my ex-husband stopped paying child support, I was encouraged to keep the children in the program for their stability and my own peace of mind. I was able to focus on getting back to work, which I did, and concentrate on my job without worrying about my sons."

Starting in 1990, Murfreesboro began offering a Summer "OPT"ion Program, a six-week, optional summer school program, open to all city school children, based on parental wishes. Designed to strengthen and expand reading and mathematics skills introduced during the school year, it also provides enrichment activities, including reading instruction one step above the reading level completed at the end of the school year. At the same time that it introduced Summer "OPT"ion, Murfreesboro expanded by four weeks an existing "Classroom on Wheels" project which takes enrichment activities right into local neighborhoods. The system also added Kindercamp, a four-week program emphasizing school readiness for pre-kindergarten children.

In August of this year, Murfreesboro opened its first K-8 year-round school. Parental freedom of choice determines enrollment. Distinguishing between the "school day," "educational services," and "extended school services," the school offers educational services from 8:00 a.m. until 5:30 p.m., and extended services before school from 6:00 a.m. and after school until 7:00 p.m.

Extended services will be available five days a week, 52 weeks a year. Interim sessions will offer 40 extra days of academic time.

Parents choosing to take advantage of educational services for their children after 3:00 p.m. (or during the 40 days) will pay a small fee, as will parents opting for extended services. Students directed by school personnel to attend supplementary classes will do so at district expense. Murfreesboro expects to accomplish all of this within its regular per-pupil expenditures figures. Mayor Joe Jackson bridles at the suggestion that extended services undermine the family: "You've got it exactly backwards," he responds. "These services support the family by making it possible for people to work without worrying because they know their children are involved in constructive learning."

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SOCORRO INDEPENDENT SCHOOL DISTRICT EL PASO, TEXAS

"It's great. I am able to spend more time one-on-one with my children."

Most school districts consider year-round schedules for financial reasons—rapid enrollment growth requires that something be done to accommodate rising numbers of students and year-round programs can increase school building usage by as much as 25 percent.

Socorro Independent School District in El Paso considered year-round education to see if the economics worked for it, but it selected year-round programming because the educational features worked for students. The district serves the students who live in the eastern part of El Paso, along with the communities of Socorro and Horizon City. To the south, the district borders Mexico. With an enrollment of more than 18,000 in 1994 (up from about 6,000 in just 10 years), the district expects more than 25,000 students by 1998—and the traditional schedule can accommodate only 18,300.

Socorro, a property-poor district, is, like everyone else, strapped for cash. A $50 million bond election in 1988 ended in a deadlock (876 votes in favor, 876 opposed). Although the measure passed three months later with a 57 percent majority, district officials worried that another bond issue would be difficult and, besides, they were already bumping up against a state ceiling on indebtedness.

The district considered its alternatives. It could schedule split sessions, theoretically doubling building capacity; it could install (more) portable classrooms; it could require higher student-teacher ratios; or it could move to year-round education.

A task force made up of students, parents, teachers, administrators, and community leaders studied the options, listened to the public in formal hearings, and after a great deal of soul searching and six months of work recommended year-round education as Socorro's best solution. As important as the

financial considerations were, the educational implications were equally significant. Socorro leaders believe that year-round education is an effective restructuring strategy to reach excellence in education. They point to better academic opportunities for students and improved professionalism of teaching, including substantial increases in teacher salaries.

In its 1991 report to the board of education, the task force argued that "all students stand to benefit from year-round education." Even if no time is added to the tradition of attending school for 180 days, the task force pointed out, the shorter, more frequent vacations, characteristic of year-round programs, reduce the amount of learning loss typical for students on a three-month summer vacation. "Although traditionally school ends in June, learning should not."

Moreover, the task force anticipated particular benefits for students able to take advantage of educational programs during the intersession periods. Underachieving students, the disadvantaged, and students experiencing difficulty with English all stood to gain—and so too did students who wanted to take advantage of recreational programs, science and arts activities, volunteer opportunities, and other enrichment efforts.

While the jury is still out on the educational effectiveness of year-round education, Socorro seems to be experiencing a wide range of benefits. According to Sue Shook, the district's assistant superintendent for strategic planning, academic performance as measured by the Texas Assessment of Academic Skills test, has improved significantly. In fact, the district exceeds the state average in most test subjects. Attendance for both students and faculty has improved, and parents seem to have adjusted to the new calendar well. One would expect Mario Aguilar to support the year-round effort—he was president of the Socorro school board that approved it. But he also supports it for two intensely personal reasons. First, his colleagues in the business world like the idea that school facilities are being used more efficiently. Second, he has four children in the Socorro schools—each on a different school calendar. Far from finding this difficult, Aguilar reports that "It's great. I am able to spend more time one-on-one with my children. When Bianca, my eighth-grader, was off-track, she went to work in my store and earned some money—and I got to spend all day with her."

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WASHINGTON COUNTY SCHOOL DISTRICT HAGERSTOWN, MARYLAND

Computers: a fundamental tool for supporting the instructional program.

Maryland's Washington County School District has long been nationally known for its leadership in education. Starting in the 1950s, the district developed a national reputation for curriculum innovation with major support from the Ford Foundation. This reputation continues today as the district breaks new ground in the use of technology for classroom management, assessment, instruction, and administration. "Since 1982 ... computers have become a fundamental tool for supporting the instructional program at all levels," according to the district's instructional technology advisory committee.

Springfield Middle School math teacher Dennis Smith uses a commercial instructional management and skills development program, ABACUS, to keep track of the progress of his students on curriculum elements in mathematics and to help prepare them for the Maryland Functional

Mathematics Test. He believes the system helps free him of tedious, time-consuming clerical work, helps him pinpoint just what a student needs and how to help him or her, increases the effectiveness of his instructional planning, and helps students prepare for, and practice taking, the state examination. According to his studies, an ABACUS-generated test accurately predicts passage (or failure) of the state competency examination 84 percent of the time.

As the world shrinks, getting students interested in the study of foreign languages is a pressing problem for most educators. Washington county is trying to address the problem through the ICONS Project, an interdisciplinary program developed at the University of Maryland that combines technology and simulation techniques to teach international negotiation and intercultural communications to high school and college students.

ICONS helps students create and test negotiation strategies, improve skills in several foreign languages, understand global interdependence, work in teams, and use computers under simulated conditions of high stress. Each country team is provided with three basic capabilities: the ability to receive messages, send messages, and conference. Students work in country teams on scenarios such as conflict in the Middle East, German reunification, the spread of nuclear weapons among nonnuclear states, and global environmental treaty disputes.

As messages are received, student translators work on them and, under tight timelines, forward English versions to the appropriate country teams. Scenarios typically last about five weeks with as many as 3,000 messages flying amongst country teams in that period. ICONS students may not really solve the world's problems, but they certainly learn a lot about international negotiations, the possibilities of technology, and the importance of language skills.

The district is also heavily into the use of technology for other uses: connecting classrooms with classrooms in other locations; CD-ROM and cataloging techniques in libraries and media centers; easing administrative and food service operations; and instructional development and networking through the Regional Education Service Agency of Appalachia a Maryland.

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CHAPTER FOUR

TECHNOLOGY AND OTHER PROGRAMS

CHAPEL SQUARE
TECHNOLOGY CENTER
ANNANDALE, VIRGINIA

The rationale for technology is many-sided.

Fairfax County Public Schools (FCPS) is in the process of implementing a technology training and technical support program to the schools. This is a new approach for the county schools. Included in the FCPS FY95 budget are funds to employ 23 individuals called technology training specialists. Each technology training specialist will be assigned to one of the county high school pyramids. A pyramid consists of a high school and the middle and elementary schools that feed into it.

The technology training specialists will provide instructional technology application training for the teachers and administrators in the schools. They may provide the training directly or coordinate the efforts of technology trainers from the central office. In addition, they will devote about one-third of their time to technical trouble-shooting in the schools. This will range from diagnosis of a problem and referring the situation to the appropriate support service in the county or correcting minor hardware and software problems.

The rationale for the Instructional Technology Plan is many-sided:

- Increase daily use of technology as an instructional and productivity tool.
- Increase access to workstations so that teachers and students may regularly collect data from a variety of media and content areas in order to create written products and multimedia presentations.
- Increase the regular use of technologies in science, social studies, language arts, and mathematics to retrieve data, analyze applications, and solve problems as described.
- Increase necessary training which is required for the implementation of the technology initiatives.
- Implement the proposed standards for English and social studies programs requiring the use of technology to analyze material; to prepare multimedia presentations; and to access, organize, and present information.
- Implement the proposed standards requiring demonstration of proficiency in the use of various technologies and software including the design and use of spreadsheet presentations.
- Implement the science standards requiring students to use technology to collect and analyze data, create and manipulate databases, telecommunicate information, and use technology to access information.
- Increase ESL students' access to technology that integrates the curriculum and uses sound to meet the needs of these students.
- Accelerate the implementation programs such as the Model Technology School Project, the modular technology education program, and the art/technology program.
- Continue aggressive work toward the full implementation of the automated catalog and information systems in the library/media centers.
- Provide access to appropriate technology to support composition and research applications in music and interactive

experiences in the spoken tongue and cultural background of foreign languages.

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CRAFTSMANSHIP 2000
TULSA, OKLAHOMA

Integrating academic, technical and work-based learning.

Leaders in Tulsa, Oklahoma are convinced that today's young people are interested in training for some of tomorrow's best-paying jobs. They believe students like to get paid while they learn. They think guaranteed summer jobs can help keep students in school. And they are sure that offering students the opportunity to finish school while earning an associate's degree and a certificate of occupational skills will be a winner. Craftsmanship 2000 offers all of those benefits.

Craftsmanship 2000, an apprenticeship program in metal-working, is no ordinary vocational-technical program. Extending over four years, it blends progressively higher academic standards with high-tech training to produce the kind of educated and skilled men and women the workforce of the future will require. Students in the program attend academic and technical classes eight hours daily during the school months, and work in industry throughout the summer, at companies sponsoring the program.

The program was established in 1990 by a group of Tulsa companies concerned about competitiveness and determined to develop a work-based learning approach to benefit both their companies and Tulsa youth. The effort was conceived as a partnership between industry, education, the political system, parents, and students that would address the mismatch between skill levels of recent graduates and increasing demand for higher craftmanship. The result: Craftsmanship 2000, Inc., a nonprofit corporation directed by representatives from local industry, Tulsa public schools, the Tulsa Technology Center and Tulsa Junior College, the mayor's office, and the local Chamber of Commerce.

This program is a systematic mix of academic, technical, and work-based training. Key elements of Craftsmanship 2000 are as follows:

- Academic and technical training days have been increased in length from six hours to eight, and the school year from 180 days to 220.
- The program extends over four years and students are admitted in their junior year of high school based on examinations of foundation skills, including achievement, aptitude and interests tests.
- Students become employees of Craftsmanship 2000, Inc., and are paid a stipend based on 40-hour weeks, totaling $30,000 per student for the four-year program. Outstanding academic, technical and job performance opens the opportunities for bonuses.
- Responsibilities are divided between the Tulsa Public Schools, Tulsa Tech, and industry during the first two years of the program. Teachers and texts are provided by the Tulsa Public Schools. Technical training and transportation are supported by Tulsa Tech. Sponsoring industries provide mentors and training sites. In the final two years, lead academic responsibility shifts to Tulsa Junior College while technical training responsibility is assured by Tulsa Tech, Tulsa Junior College and industry.
- The curriculum—emphasizing academic, technical, social, and learning-to-learn skills—has been jointly developed by

company representatives and technical personnel working with curriculum specialists.

- All teachers, trainers, and mentors in the program receive extensive training. A training committee wrote detailed "learner outcomes" emphasizing the need for a better understanding of the world of work on the part of teachers—and a better understanding of how teenagers learn on the part of employers.

Craftsmanship 2000 officials do not speak about what they plan to do "if" the model is successful. There is no question in their minds that it will work, and when it has demonstrated its value they intend to extend the concept to other disciplines.

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HUNTERDON CENTRAL REGIONAL HIGH SCHOOL DISTRICT
FLEMINGTON, NEW JERSEY

"Wow, what is this?"

"In today's society, Grandpa isn't around anymore to take us down the cellar, pull apart a radio and show us the logic of how things work," says Phil Hammel, design and technology teacher, at Hunterdon Central Regional High School. "My role is to facilitate problem-solving situations that help students learn to think, discern, and make good choices."

To do so, Hammel employs a state-of-the-art technology classroom that serves as a prototype of what learning might look like in the 21st century. "Wow, what is this?" students exclaim frequently on seeing the classroom and its equipment, which is comparable to what might be found on a university campus or the modern workplace.

Hammel's students use computers to plan, draw, display, calculate, and forecast projects before a tool is ever put to metal or wood. Computers also help operate machines and manipulate materials to turn ideas into finished products. "Students have to have hands-on experience with the materials," says Hammel. "Throwing out the lathes and just filling the room with computers is a mistake."

Hammel's classroom is one of four prototype classrooms built as models for future planning by the new superintendent, Raymond Farley, who arrived at Hunterdon Central in 1990. "One of my goals was to improve instruction by focusing on self-directed learning," explains Farley. "Our facility, however, did not encourage this approach. Self-directed learning demands an environment that allows ideas to flourish and provides tools that encourage risk-taking. How could we expect teachers to perform miracles in outdated, ill-equipped, factory-model classrooms using the same tools educators relied on at the beginning of the 20th century—namely a book, a blackboard, and a piece of chalk."

The four classrooms are part of a larger transformation that have made "Hunterdon Central truly a beacon," according to Governor Christie Whitman who helped dedicate the classrooms in March 1994. The rest of the transformation was on display during the governor's address to the students, staff, and community from the school's television studio, broadcast live in the school and over local cable to the community.

. Located on a 72-acre campus, approximately 1,800 students can take advantage of two classroom buildings, a 2,000-seat field house, an instructional media center, and buildings for music and vocational education.

Technology is a big factor in this modern, comprehensive high school. Students and teachers can take advantage of:

- eight 24-station student computer laboratories, including two networks;
- courses in keyboarding, applications, programming in Basic and Pascal; computer-aided drafting; and word processing;
- a 35-drive CD-ROM network system in the instructional media center;
- a student-run FM radio station and a student-run television station;
- telephones in every classroom and voice-mail for every teacher;
- an electronic bulletin board system; and
- a fiber-optic backbone networking the entire campus.

With these tools in hand, computer activities infuse the Hunterdon Central curriculum. The use of word processing, database, simulation, and spreadsheet programs can be found in everything from English, mathematics, and science to arts and music, health, physical education, and vocational programs in design and technology.

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IMAGE PROCESSING FOR TEACHING PROJECT
UNIVERSITY OF ARIZONA

In the digital age, a picture is worth about a million words.

In early 1995, the Image Processing for Teaching Project at the University of Arizona, Tucson, will release a new version of a tutorial introducing the classroom use of image processing—a package of interactive lessons and videos designed to introduce digital image processing to teachers and students.

What is digital image processing? For the generalist, it is the technology that permits scientists to manipulate images in order to highlight some features that had previously been hard, or impossible, to see. Nonscientists use this technology to look at pictures relayed back to Earth in digital form from light years away in space, or to examine the results of CAT-scans of soft tissue in the body, such as the brain.

University of Arizona scientists point out that human beings are visual learners. The human eye can process and analyze up to 100 million bits of information each second. By contrast, the spoken words absorbed by the ear amount to only a few hundred bits of information a second. In the digital age, a picture is worth about a million words.

The IPT project, begun in 1990, was created to explore the possibility that digital image processing could play a significant role in science and mathematics education—for a visual species, the manipulation of images might provide a more attractive and effective way to teach than language-based methods. Moreover, since image processing was developed to make exploration and discovery easier in the research community, its effective use in the classroom would require abandoning old methods of teaching—drilling and rote memorization—in favor of encouraging creativity and problem-solving in students.

Carla McAuliffe teaches Earth Science and AP Biology at Maryvale High School in Phoenix. Since 1993, she has been using these new techniques as a "way of bringing

"real" scientific experiences to my students. I emphasize that *scientists* make discoveries—computers are merely tools that aid in the discovery process."

Concludes McAuliffe: "What I like most about image processing is that students are in control of their learning. My role shifts to that of facilitator."

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LEARNING THROUGH COLLABORATIVE VISUALIZATION
NORTHWESTERN UNIVERSITY

A blueprint to inform educators, researchers and policymakers about the effective use of interpersonal, collaborative media in science education.

Most K-12 science education consists of teaching well-established facts, an approach that bears little or no resemblance to the question-centered, collaborative work of real scientists. With the help of a grant from the National Science Foundation, along with a group of academic and corporate partners (for example, the Exploratorium, the University of Illinois, the University of Michigan, Aldus Software, Ameritech, Apple Computer, Sony, and Sun Microsystems), Northwestern University is trying to change all of that with the CoVis (collaborative visualization) project.

In the first-ever educational use of wideband ISDN networks, Northwestern enables high schools students to join with peers at remote locations in collaborative work groups. Students can also communicate with university researchers and other scientists. They study atmospheric and environmental sciences through special projects, using state-of-the-art scientific visualization software, specially modified to their learning environment. These students actually have access to the same research tools and data sets used by cutting-edge scientists in the field.

The CoVis project provides students with a "collaboratory" workbench that includes desktop video teleconferencing; shared software environments for remote, real-time collaboration; access to the resources of Internet; a multimedia scientist's "notebook;" and scientific visualization software. The CoVis team also works with teachers in participating schools to develop new curricula and teaching approaches. CoVis is, in many ways, a blueprint to inform educators, researchers, and policymakers about the effective use of interpersonal, collaborative media in science education.

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NATIONAL YOUTH SCIENCE FOUNDATION
BARTOW, WEST VIRGINIA

A week of science camp equals a month of school-based learning.

Most young people like summer camps and the National Youth Science Foundation (NYSF) has discovered a model that combines the excitement of an outdoor setting with the joy of learning: National Youth Science Camp (NYSC), a tried-and-true opportunity for experiential learning that can be copied by

states and school districts anywhere. The NYSC represents an almost painless way to extend the school calendar. In fact, similar programs exist in other disciplines: some environmental camps emphasize principles of biology in multiweek residential programs. At least one former "typical summer camp" in Maine has found new energy, and commercial success, as a music camp—combining high-quality instruction in major instruments in the morning with recreation and camping activities in the afternoon and evening.

Some education specialists estimate that a week in residential camps is equivalent to a month of traditional school-based learning. NYSF officials point out that if other schools in the United States were to offer one- or two-week science camps as part of an extended academic year, the impact on science learning nationally would be impressive.

Founded in 1963 for West Virginia's centennial celebration, the National Youth Science Camp encourages development of thoughtful scientific leadership. Every summer, it hosts two just-graduated seniors from each state and the District of Columbia for four weeks of intensive study. Funded by the State of West Virginia and corporate and private sponsors, the tuition-free NYSC offers hands-on research, provocative lectures, and a challenging outdoor program. Projects and lectures cover the full range of scientific disciplines and feature prominent scientists talking about their work in basic research and technology, whether at academic, corporate, or government institutions. Art, music, and the humanities complement the science program.

Most days at the NYSC include morning and evening lectures; afternoons feature research, day trips, and seminars organized by scientists, staff members, or delegates. Free time activities range from frisbee to fishing with plenty of athletics. On weekends, students depart on backpacking, rock-climbing, caving, or kayaking trips designed to develop new skills, explore new environments, and have fun with new friends. With the camp located in West Virginia's Highlands, delegates have access to vast natural resources, plus local landmarks such as the Cass Scenic Railroad, and the Greenbrier Hotel. Delegates collaborate with scientists at nearby National Radio Astronomy Observatory, while a three-day trip to Washington, D.C. allows behind-the-scene visits to Goddard Space Flight Center and the Smithsonian Institution.

Alumni surveys show the camp does a lot for budding science leaders and for science; many past participants are practicing scientists who call the NYSC a "formative experience." Best of all, according to National Youth Science Foundation officials, the science camp concept can be modified to accommodate other disciplines and the needs of specific students—for example, camps can emphasize history or literature or be specially tailored for at-risk students, minority youngsters, young women, or students with disabilities. The Foundation is planning additional science camps for teachers and students and in 1994 adopted the NYSC format for its first 16-day Mountaineer Youth Science Camp for two juniors from each of West Virginia's 55 counties.

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